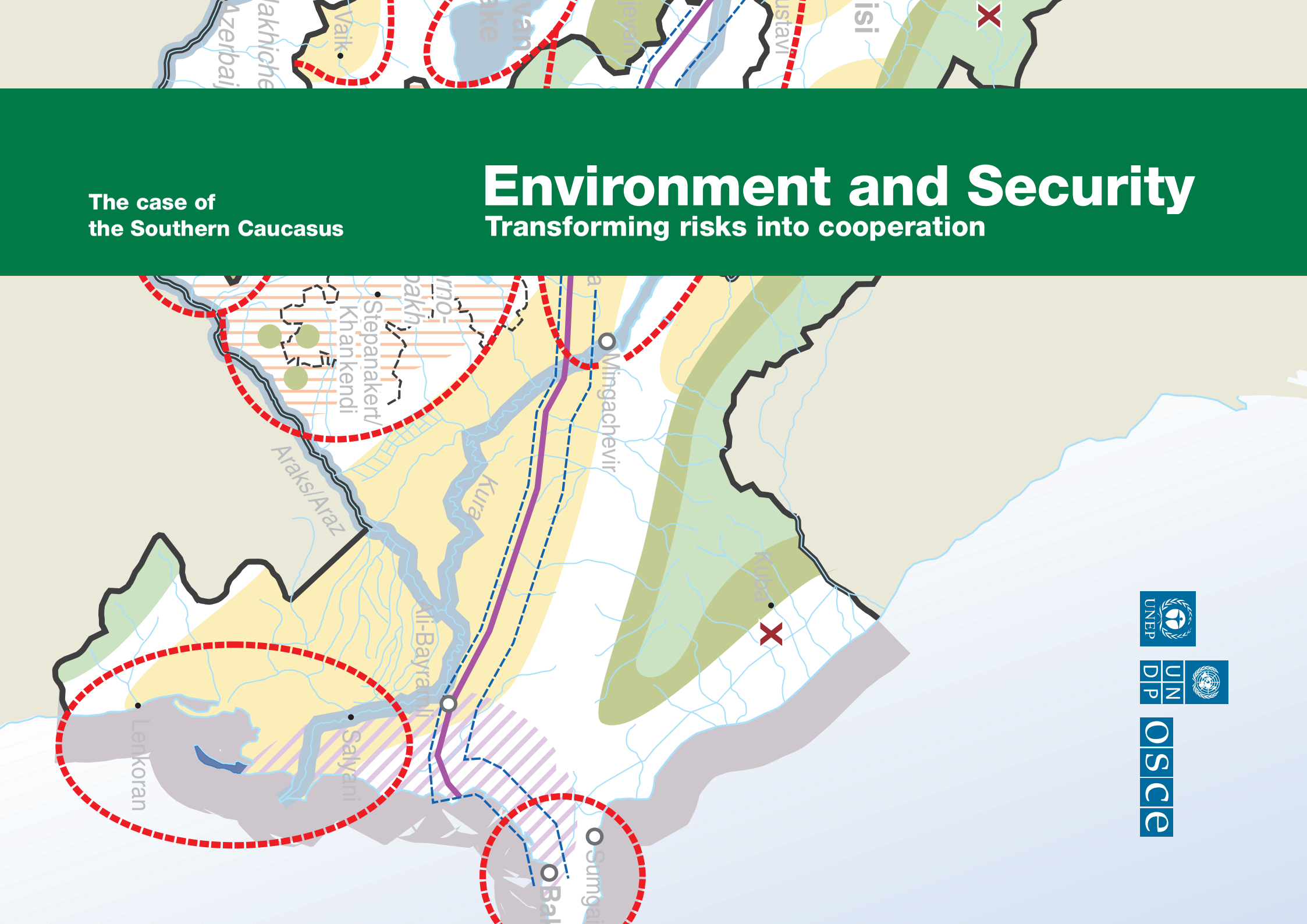
Environment and Security

Transforming risks into cooperation

The case of the Southern Caucasus



UNEP

UNDP

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The **United Nations Development Programme** is the UN´s Global Development Network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. It operates in 166 countries, working with them on responses to global and national development challenges. As they develop local capacity, the countries draw on the UNDP people and its wide range of partners. The UNDP network links and co-ordinates global and national efforts to achieve the Millennium Development Goals.

The **United Nations Environment Programme**, as the world's leading intergovernmental environmental organization, is the authoritative source of knowledge on the current state of, and trends shaping the global environment. The mission of UNEP is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

With 55 participating states, the **Organization for Security and Co-operation in Europe** is a pre-eminent instrument for early warning, conflict prevention, conflict management and post-conflict rehabilitation in continental Europe, the Caucasus, Central Asia and North America. Since its beginnings in 1973, the OSCE has taken a comprehensive view of security, including through the protection and promotion of human rights and fundamental freedoms, economic and environmental co-operation, and political dialogue.

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The case of the Southern Caucasus

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Preface

Peacefully resolving the overriding political, economic and social concerns of our time requires a multifaceted approach, one that includes mechanisms to address the links between the natural environment and human security. The United Nations Development Programme, United Nations Environment Programme and the Organization for Security and Co-operation in Europe have joined forces in the Environment and Security (ENVSEC) Initiative to offer countries their combined pool of expertise and resources towards that aim.

The ENVSEC Initiative was launched in August 2002 in response to demand from the governments of Central Asia and South Eastern Europe. The assessments of those regions were presented at the Kiev Environment for Europe Ministerial Conference in May 2003. To address the priority issues and hot spots identified, the ENVSEC partners have since worked with the governments to design and implement targeted follow-up activities.

At the invitation of the governments of Armenia, Azerbaijan and Georgia, ENVSEC has now been extended to the countries of the Southern Caucasus. Stakeholders consulted in these countries have identified the following linkages between environmental stress and potential social tension and areas of particular vulnerability:

- Environmental degradation and access to natural resources in areas of conflict
- Management of cross-border environmental concerns: cross-border water resources, natural hazards, and industrial and military legacies
- Population growth and rapid development in capital and other major cities

The work programme will be built around three pillars:

- In depth vulnerability assessment, early warning and monitoring of "at risk" areas
- Policy development and implementation
- Institutional development, capacity building and advocacy

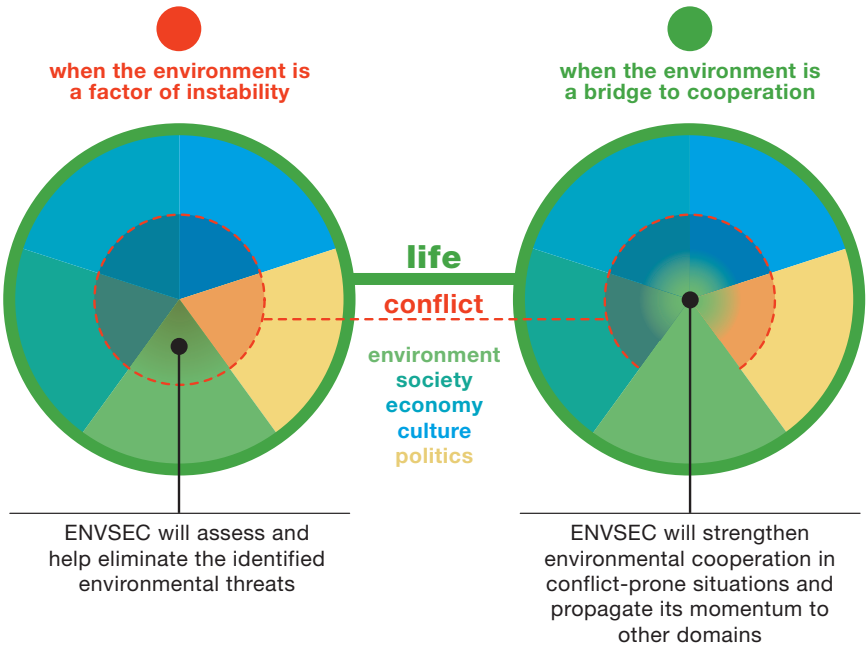
Tackling certain environment and security priorities may also require infrastructure development and remediation activities, for which UNDP, UNEP, and OSCE will help to identify partners with appropriate capacities. As a first step, the lead organizations have worked with local partners to establish National Co-ordination Groups within each of the countries to assist in the implementation and monitoring of follow-up projects.

The people of the Southern Caucasus countries face a time of far-reaching social and economic transformation. Environmental protection and sustainable resources management are means for the attainment of a more secure and prosperous future.

In the service of this aim, NATO is welcomed to the ENVSEC Initiative as an associate. Other organizations, institutions, foundations and donors are invited to join the Initiative, to sponsor and co-operate in the implementation of activities within the framework of the Initiative, and to lend their expertise to this common effort.

Ben Slay	Director, UNDP Bratislava Regional Centre
Frits Schlingemann	Director and Regional Representative in Europe, UNEP ROE
Marcin Swiecicki	Co-ordinator of OSCE Economic and Environmental Activities, OSCE

two facets of the environment and security



Introduction

About the "Environment and Security" initiative

Acknowledging the multifaceted character of environmental sources of human insecurity, and at the invitation of governments, three international organizations with complementary mandates, expertise, and networks — the Organization for Security and Co-operation in Europe (OSCE), United Nations Environment Programme (UNEP), and United Nations Development Programme (UNDP) — formed the Environment and Security (ENVSEC) Initiative in 2003.

Working in consultation with national and international experts, ENVSEC seeks to help identify and map those situations where environmental problems threaten to generate tensions or offer opportunities for synergies – among communities, countries or regions. From the spatial representation of results elaborated in its consultative assessments, ENVSEC seeks to help host governments generate an agenda of environmental management instruments that can be utilised in the promotion of peace and human security.

The ENVSEC Initiative builds on the combined strengths and field presence of the lead organizations to perform three key functions: assessment and monitoring of environment and security linkages; capacity building and institutional development; and integration of environmental and security concerns and priorities in international and national policy-making.

This Initiative offers governments a valuable approach in seeking to tackle the interconnections between environment and security because:

- It is an open forum that functions at the invitation of governments, aimed at ensuring coordination between international institutions and drawing on their respective strengths and experience;
- It draws its analysis from consultations with government, academia and civil society from the region, fostering local ownership of the outcomes;
- It seeks to overcome disciplinary borders and to combine analytical, geographic and communication skills to address policy-makers at various levels; and
- It aims to implement practical approaches to the resolution of environment and security linkages in vulnerable areas.

ENVSEC is governed by a management board of representatives of the three partner agencies, with an advisory committee providing scientific and policy advice. The North Atlantic Treaty Organisation (NATO) has also joined ENVSEC as an associate, through its Public Diplomacy Division. A Programme Management Unit co-ordinates activities amongst the institutions and acts as the secretariat for the Initiative. Additional information on the structure and organization of the ENVSEC Initiative can be obtained from our website, at www.envsec.org.

Why link Environment and Security in the Southern Caucasus?

The Southern Caucasus – composed of Armenia, Azerbaijan, and Georgia – has long been a focal point for change, a bridge between Asia and Europe. Today, social, political and economic transformations are altering century-old relationships between countries and communities, affecting and being affected by the natural environment. In the worst case, environmental stress and change could undermine security in the region. In the best, sound environmental management and technical cooperation can be a means for strengthening security in the Southern Caucasus, while promoting sustainable development. What priority actions can be taken to harness the environment for peace?

The interaction between environment and other human security pressures in contributing to or reducing the threat of instability is complex and context-dependent.[1] Although conflicts have multiple causes, research suggests that the degradation, depletion, or mismanagement of natural resources linked to demographic change can have a negative impact on local and international stability by:[2]

- reinforcing and increasing grievances within and between societies. Where few alternatives remain, or where perceived inequities or opportunities for enrichment are great, groups may compete for resources, creating opportunities for violence to emerge.
- weakening states, whether by providing revenues for insurgents and criminal groups, by depressing economic productivity, or by undermining the legitimacy of the state in the eyes of its citizens.

But environmental cooperation can also be a basis for international peace-building and post-conflict reconstruction and reconciliation.[3] A convincing body of work has demonstrated, for example, that nations are more likely to cooperate than to fight over control of international river basins.[4]

1. On the links between natural resource scarcity and violent conflict, see for example Homer-Dixon, T.F. *Environment, Scarcity and Violence*, Princeton University Press, 1999; Dalbelko, G., Lonergan, S. and Matthew, R. *State of the Art Review on Environment, Security and Development Cooperation*. IUCN/OECD DAC, 1999. May be downloaded from www.oecd.org or www.iisd.ca/natres/security. On the links between natural resource abundance and violence see for example Ballentine, K. and Nitzschke, H. *Beyond Greed and Grievance: Policy Lessons from Studies in the Political Economy of Armed Conflict*. IPA Policy Report, October 2003 and Collier, P. *et al. Breaking the Conflict Trap: Civil War and Development Policy*. World Bank, 2003.

2. Kahl, C. *States, Scarcity and Civil Strife in the Developing World*. Institute for War and Peace Studies, Columbia University, April 1999.

3. Conca, K. and Dabelko, G. *Environmental Peacemaking*. Woodrow Wilson Center Press and John Hopkins University Press, 2003.

4. See for example, Wolf A, Yoffe, S, and Giordano, M. International Waters: Identifying Basins at Risk. Water Policy, Vol. 5 no. 1: 29-60 and Makim, A. "Resources for Security and Stability? The Politics of Regional Cooperation on the Mekong, 1957-2001" in *Journal of Environment & Development*, Vol. 11, No. 1, March 2002:5-52.

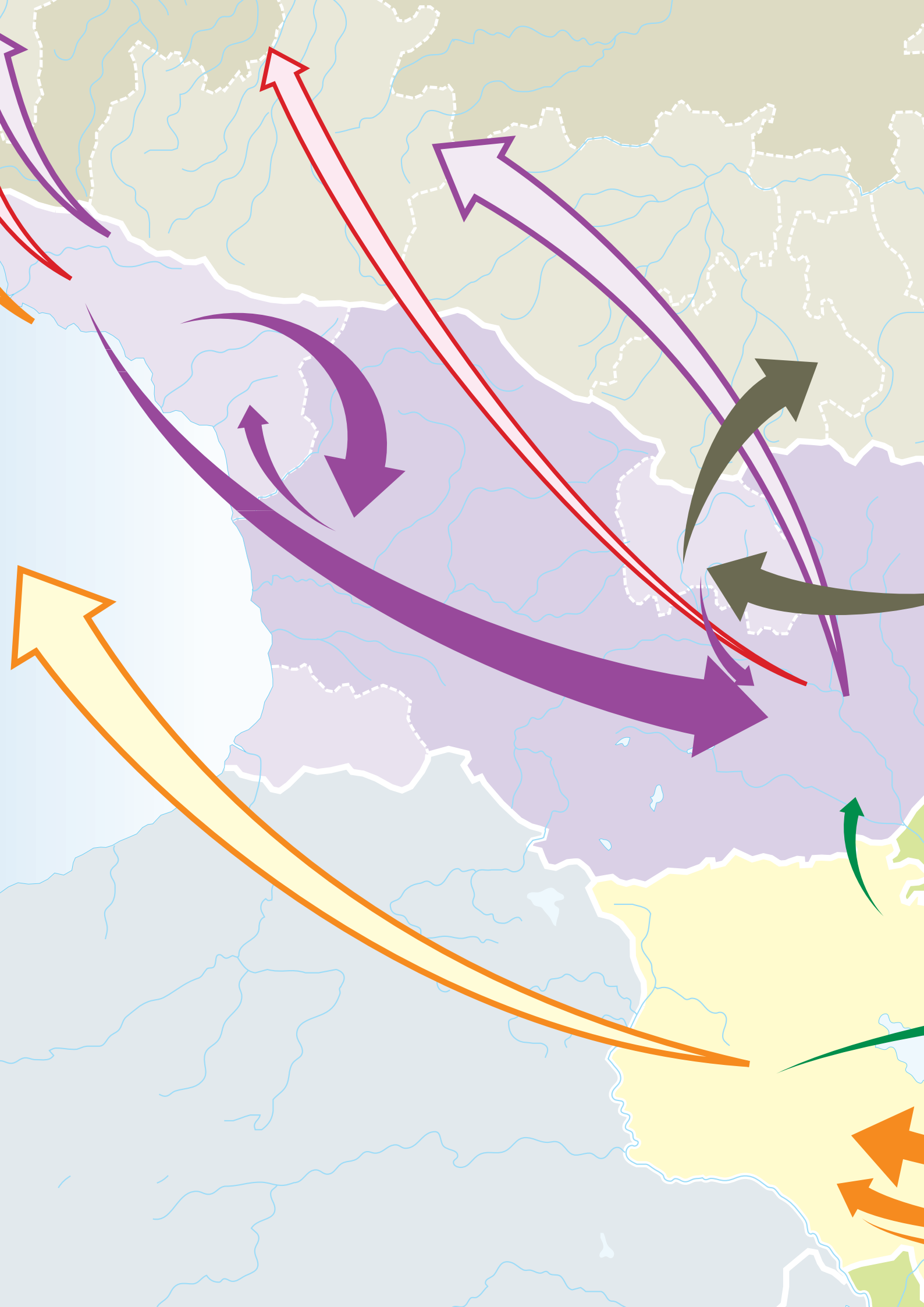
The report that follows briefly presents a preliminary assessment of environment and security linkages in the Southern Caucasus, carried out at the request of the host governments and in consultation with national experts. Its purpose is to establish the parameters for follow-up action by national authorities and international partners.

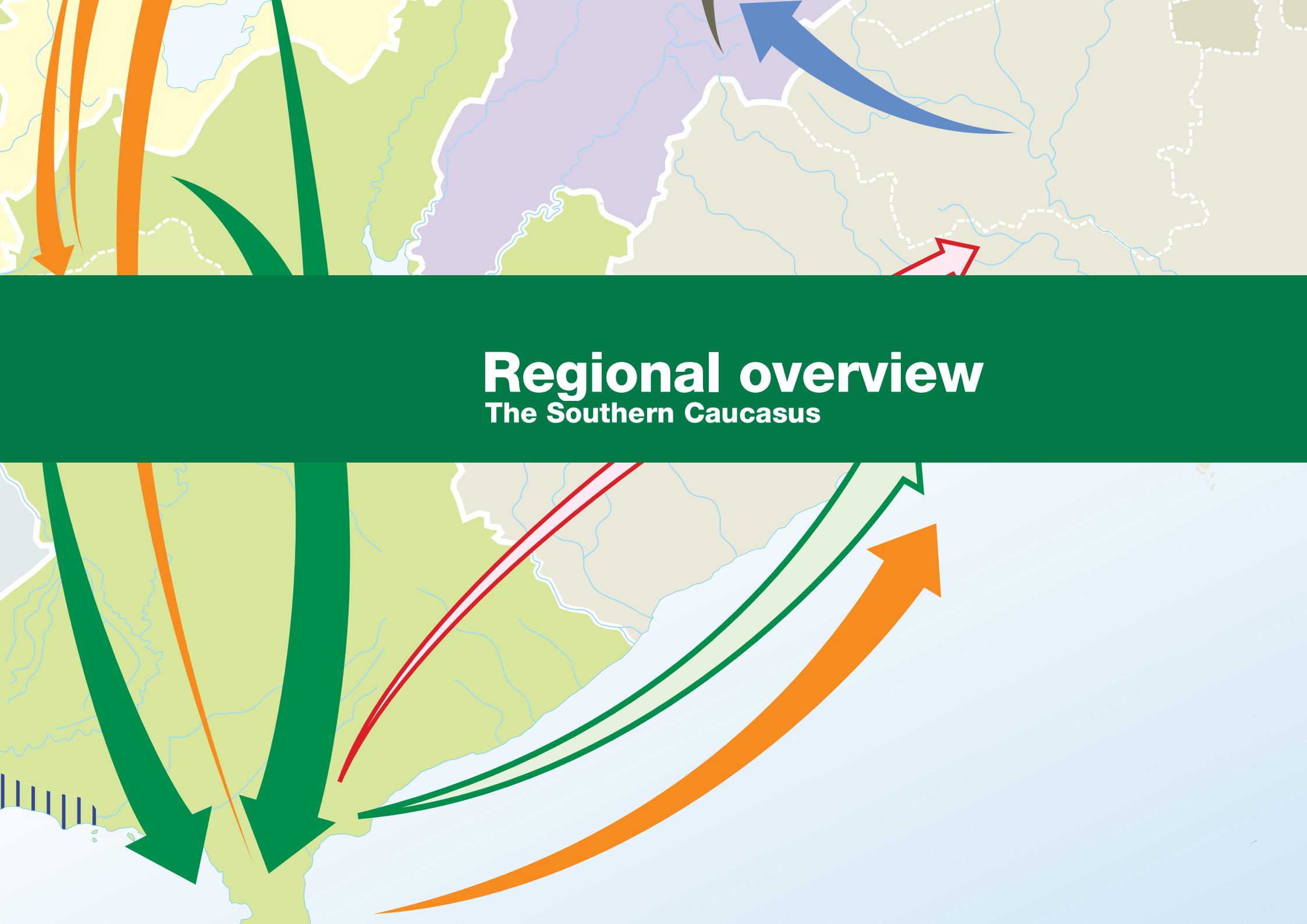
This report contains a preliminary account of the ENVSEC Initiative's findings in the Southern Caucasus countries of Armenia, Azerbaijan, and Georgia. It is the distillation of national assessment reports, environmental, economic and social data collection and inputs from a technical regional workshop held in Tbilisi in November 2003 and national consultations held in Yerevan (May 10-11), Tbilisi (May 14-15) and Baku (May 17-18) in 2004. The consultations drew upon representatives from ministries of Foreign Affairs, Environment, Defence, Health, Agriculture, National Security, from national parliaments and from civil society, who identified what they believed to be predominant environment and security concerns in their countries.

The sections that follow present the results of the consultations and data-gathering exercises and identify some priority environment and security risk factors, at the regional and national levels. A multi-year work programme will be elaborated in consultation with host governments for follow-up by UNDP, UNEP and OSCE.

"There [is] … much more willingness to look at ways for regional cooperation, to create more of the spirit that we are living in one region and we should enjoy cooperation between ourselves and not just keep the South Caucasus as a battlefield, as a field for constant confrontation between us."

CSIS Statemen's Forum "After the rose revolution: building Georgia's future". Zurab Zhvania, Prime Minister of Georgia, April 26, 2004.
www.csis.org/ruseura/040426_zhvania_transcript.pdf





Regional overview

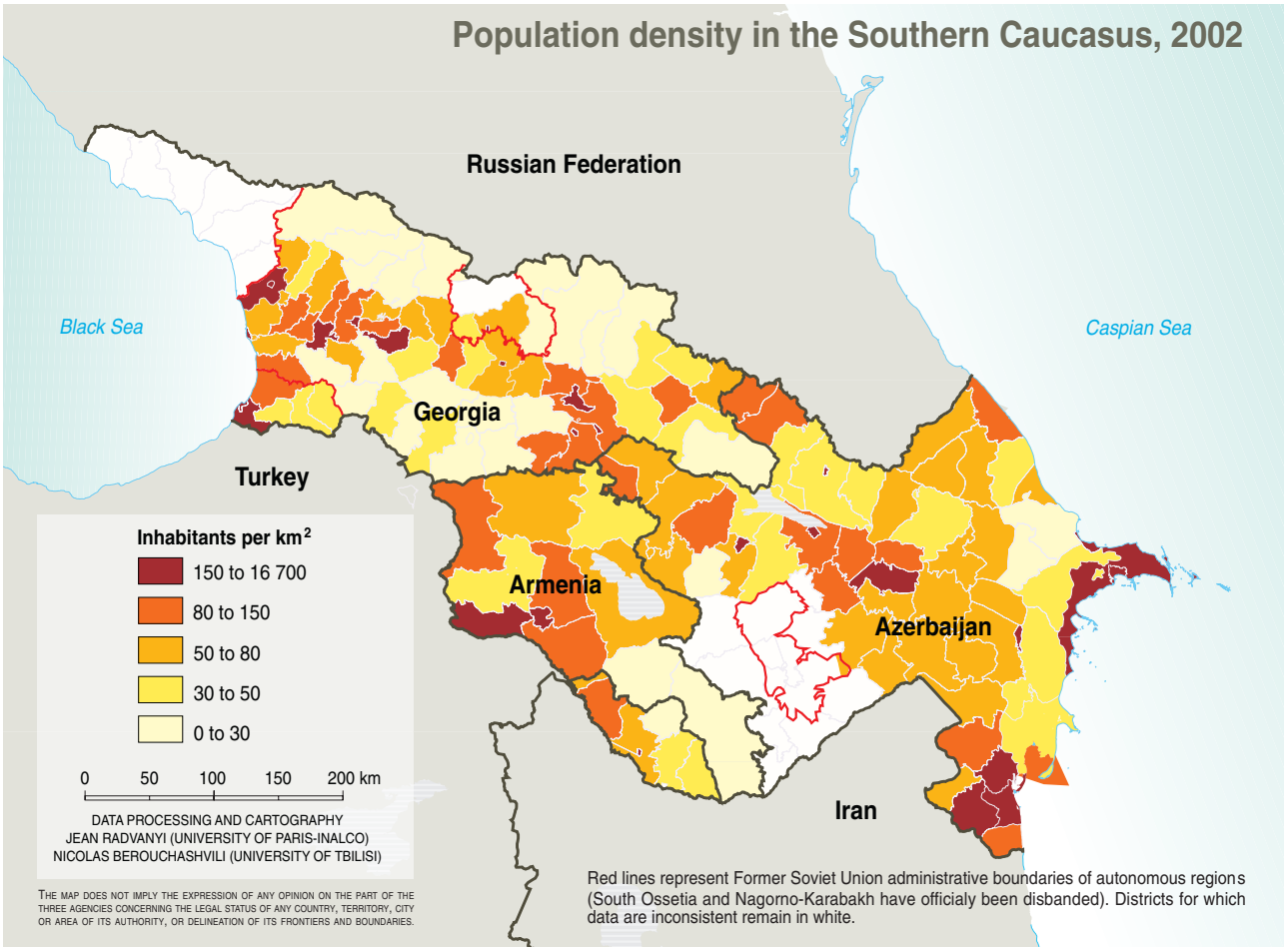
The Southern Caucasus

Human security in a regional context

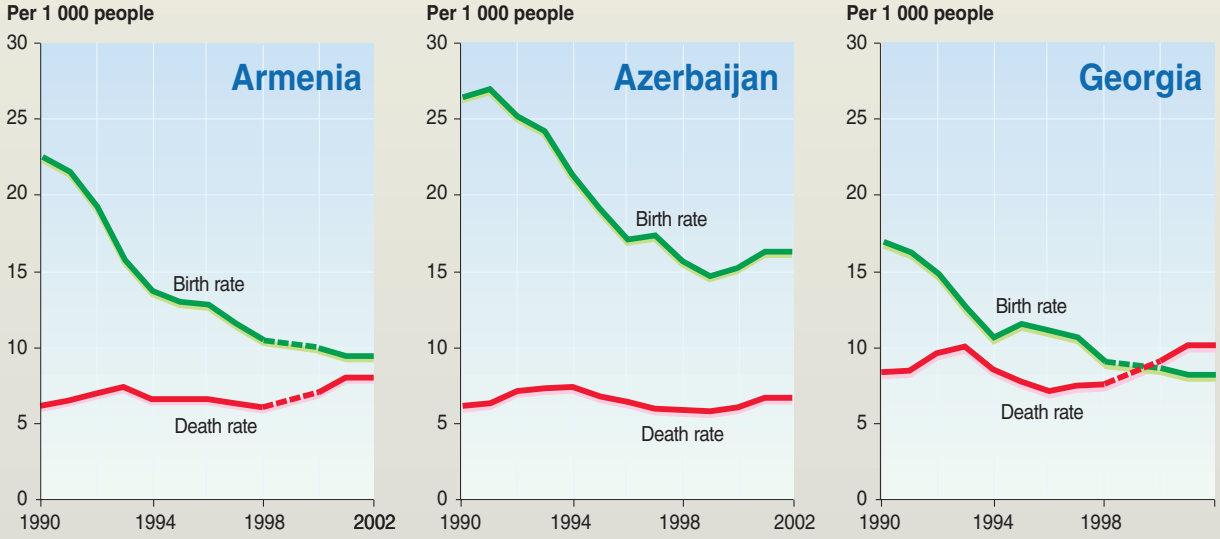
Regional overview

Located between the Caspian and the Black Seas, and surrounded by economically, politically and culturally influential neighbours (Turkey, Iran and Russia), the former Soviet republics of Southern Caucasus – Armenia, Azerbaijan and Georgia – became independent states in 1991. The three countries were challenged throughout the 1990s by the dismantling of Soviet economy, and by the pressures of political transformation. Today, while continuing to suffer from the dramatic economic decline and environmental legacies of those times, the Southern Caucasus nations are emerging into a period that offers hope for a more prosperous and environmentally sustainable future.

The Southern Caucasus countries share a recent history marked by tension and violent struggle, economic collapse and nascent recovery, and slow democratic development. In addition to this common past, they are today confronted by similar social, political and economic transformations that are altering century-old relationships within and between them, as well as shaping the declining demographic trends described in the figures below. Each of these transformations both has an impact on and could be affected by the state of the natural environment.

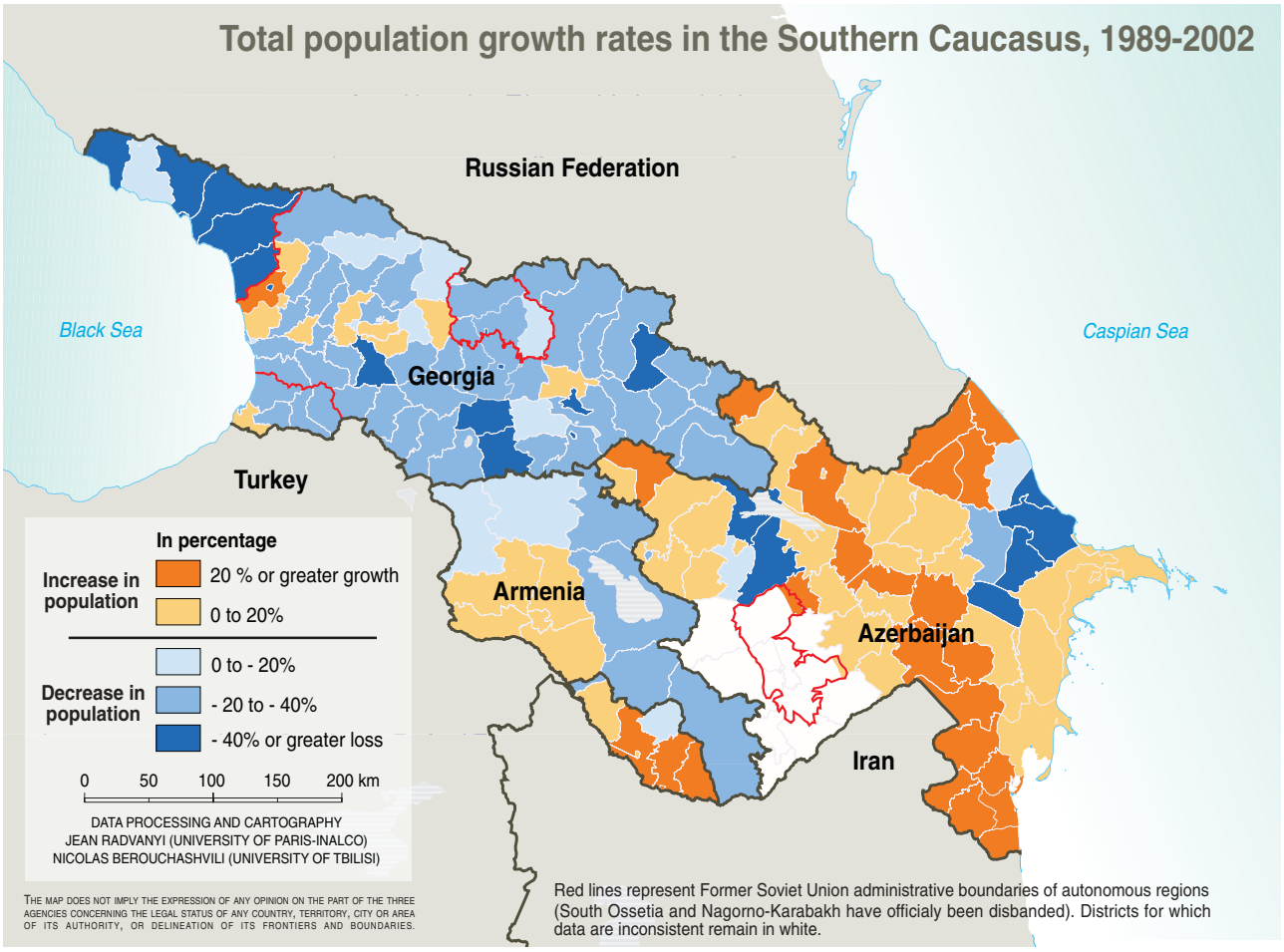


Trends in birth and death rates in the Southern Caucasus, 1990-2002



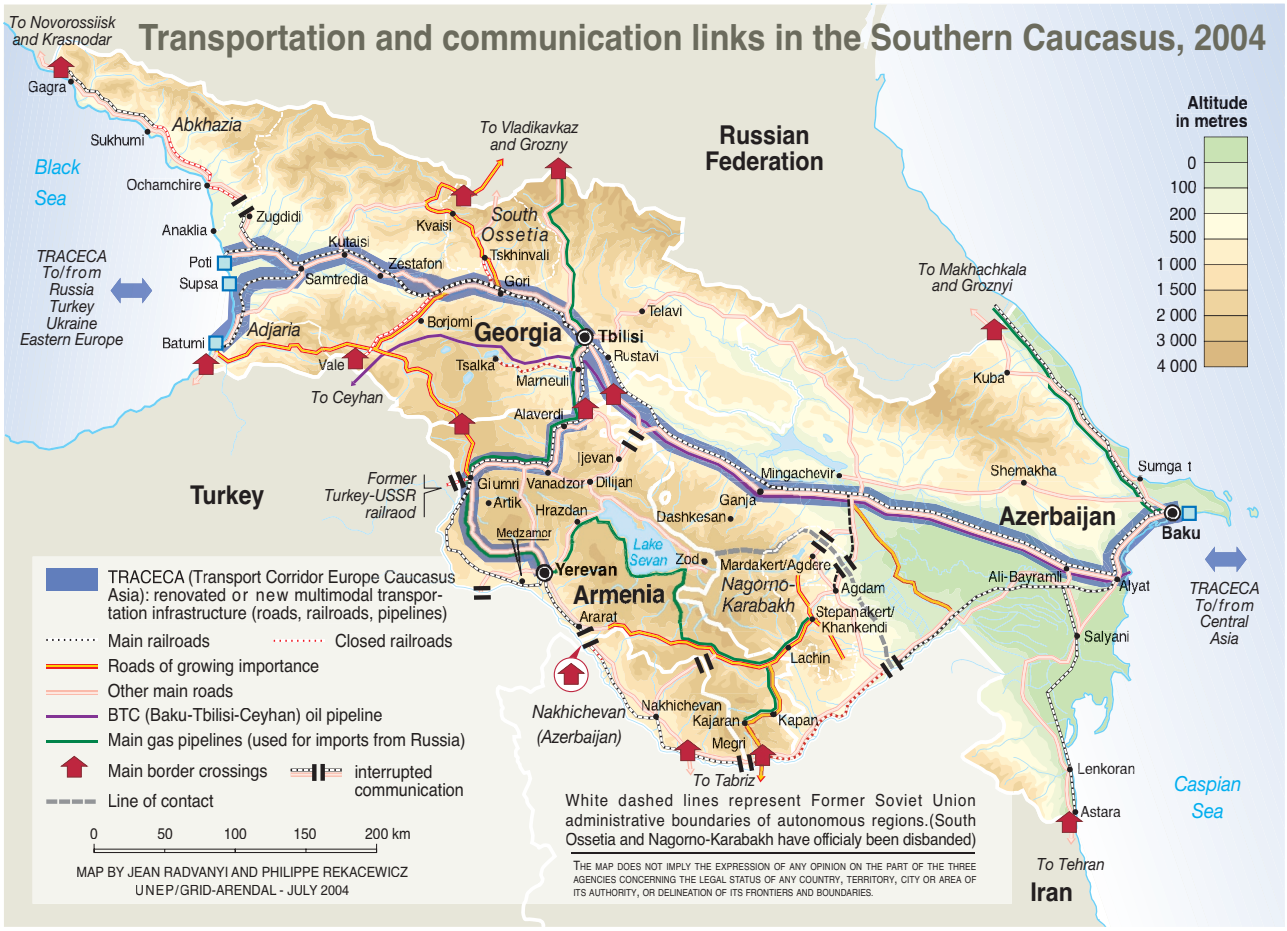
Source: Online database, The World Bank, Washington DC.

Total population growth rates in the Southern Caucasus, 1989-2002



THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF THE THREE AGENCIES CONCERNING THE LEGAL STATUS OF ANY COUNTRY, TERRITORY, CITY OR AREA OF ITS AUTHORITY, OR DELINEATION OF ITS FRONTIERS AND BOUNDARIES.

Red lines represent Former Soviet Union administrative boundaries of autonomous regions (South Ossetia and Nagorno-Karabakh have officialy been disbanded). Districts for which data are inconsistent remain in white.



Political and Strategic Issues

Instability in the Southern Caucasus is rooted in ethnic and territorial tensions, and in secessionist movements. The Southern Caucasus is also strongly influenced by the diverging geopolitical alliances including an expanding European Union and NATO, and by the growing global significance of Caspian oil and gas resources and transportation pipelines. This has dramatically increased the importance of these countries to the Russian Federation, to Europe and to the United States.

In the Southern Caucasus, regional co-operation is affected by unresolved conflicts, slowing down economic development.

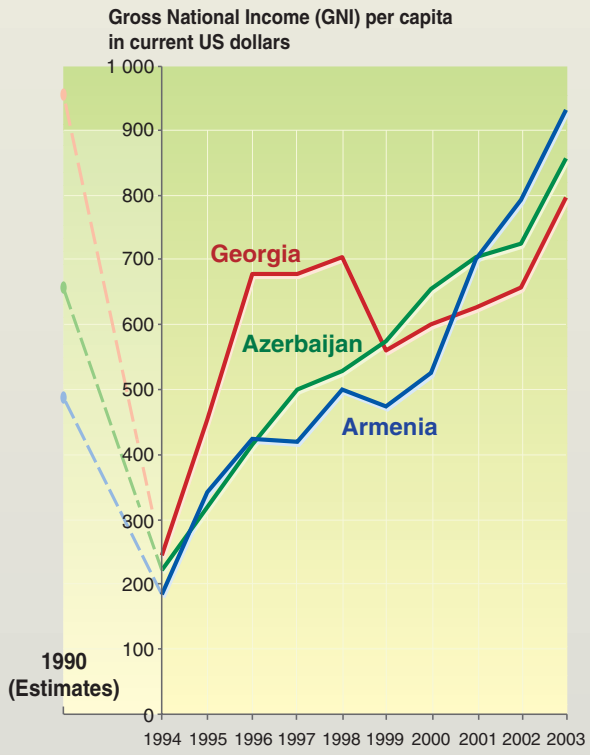
Economic Issues

A dramatic economic slowdown accompanied the transition from Soviet economic planning to capitalist markets, beginning in 1991 with independence. This transition was marked by a sudden fragmenting of state monopolies, and by mass industrial privatisation under conditions of capital shortage. Political and social turmoil placed additional brakes on the economy, hampering foreign investment in the early days of independence. From 1991-1994, Gross National Income (GNI) dramatically fell in the three Southern Caucasus countries, and the wheels of industry greatly halted, resulting in high unemployment.[5] International assistance funds were insufficient to fully replace Soviet-era subsidies, while economic restructuring programmes had serious social consequences for people in these post-Soviet states.[6]

5. According to the World Bank givens of 2002, the per capita Gross National Income of Armenia was 790 USD, of Azerbaijan 710 USD, and of Georgia 650 USD. The data was calculated by the Atlas method. See: http://lnweb18.worldbank.org/eca/eca.nsf. UNDP *Human Development Report 2003* places the three countries under "Medium human development" with the following ranks: Georgia 88, Azerbaijan 89, and Armenia 100. See the report at: http://hdr.undp.org/reports/global/2003/pdf/hdr03_HDI.pdf

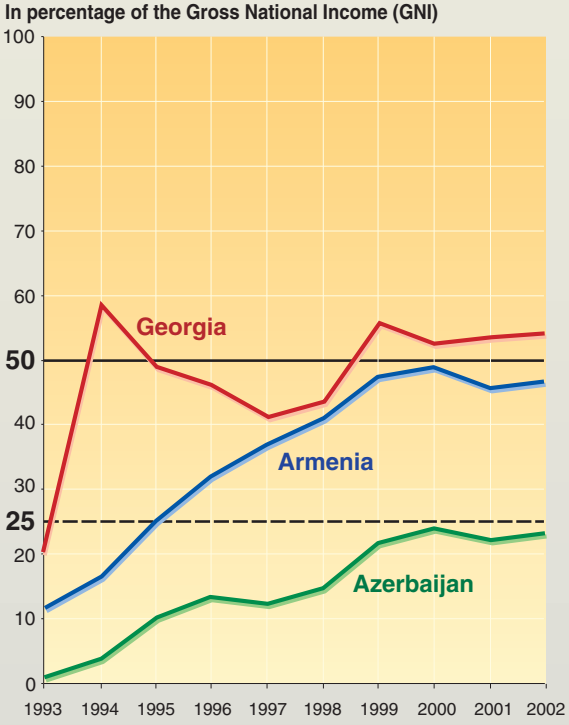
6. This point is strongly argued by Neil MacFarlane, *Western Engagement in the Caucasus and Central Asia*, The Royal Institute of International Affairs, London, 1999, pages 7-9.

Economic output in the Southern Caucasus, 1990-2003



Source: Economist Intelligence Unit (EIU), London.

External debt in the Southern Caucasus, 1993-2002



Source: International Monetary Fund (IMF); Online database, The World Bank, Washington DC.

In spite of economic recovery in recent years, living standards and national economic productivity remain below those of the Soviet era. Since 2002, Armenia and Azerbaijan have achieved annual Gross National Income (GNI) growth rates of 11 and 10.6 percent respectively. Georgia's GNI grew by 8 percent in 2003, fuelled by the development of the Baku-Tbilisi-Ceyhan (BTC) pipeline and related ventures.

Government programmes for poverty reduction and economic development are planned for all three countries to consolidate these recent economic achievements, though implementation is limited. As a result, only a small portion of the population is profiting from the new economic development, while social inequalities continue to rise. Economic development has been concentrated in the capital cities, while other urban centres and provincial regions remain underdeveloped.

As low-income countries with small populations, some countries of the Southern Caucasus offer a limited market for international investment. Economic development programmes demonstrate the will of the governments to improve the business environment, particularly for small and medium enterprises (SME). In practice, however, entrepreneurship is discouraged by poor access to affordable start-up capital, by lack of access to or distorted information on markets and regulations, and by weak legal systems. This pushes many SMEs into the informal sector, resulting in lost tax revenue and job creation opportunities.

One of the major challenges undermining government control, socio-economic and democratic development across the Southern Caucasus is corruption. On the one hand, corruption is a symptom of the limitations of state institutions. On the other, corruption hampers economic, political and institutional development. Transboundary crime, trafficking in drugs, arms and people, and the black market economy, are all linked to corruption and weak legal systems. Together, they contribute to the loss of tax revenue for public investment and law enforcement, while undermining enforcement capacity, which together allow illegal and corrupt habits to continue.

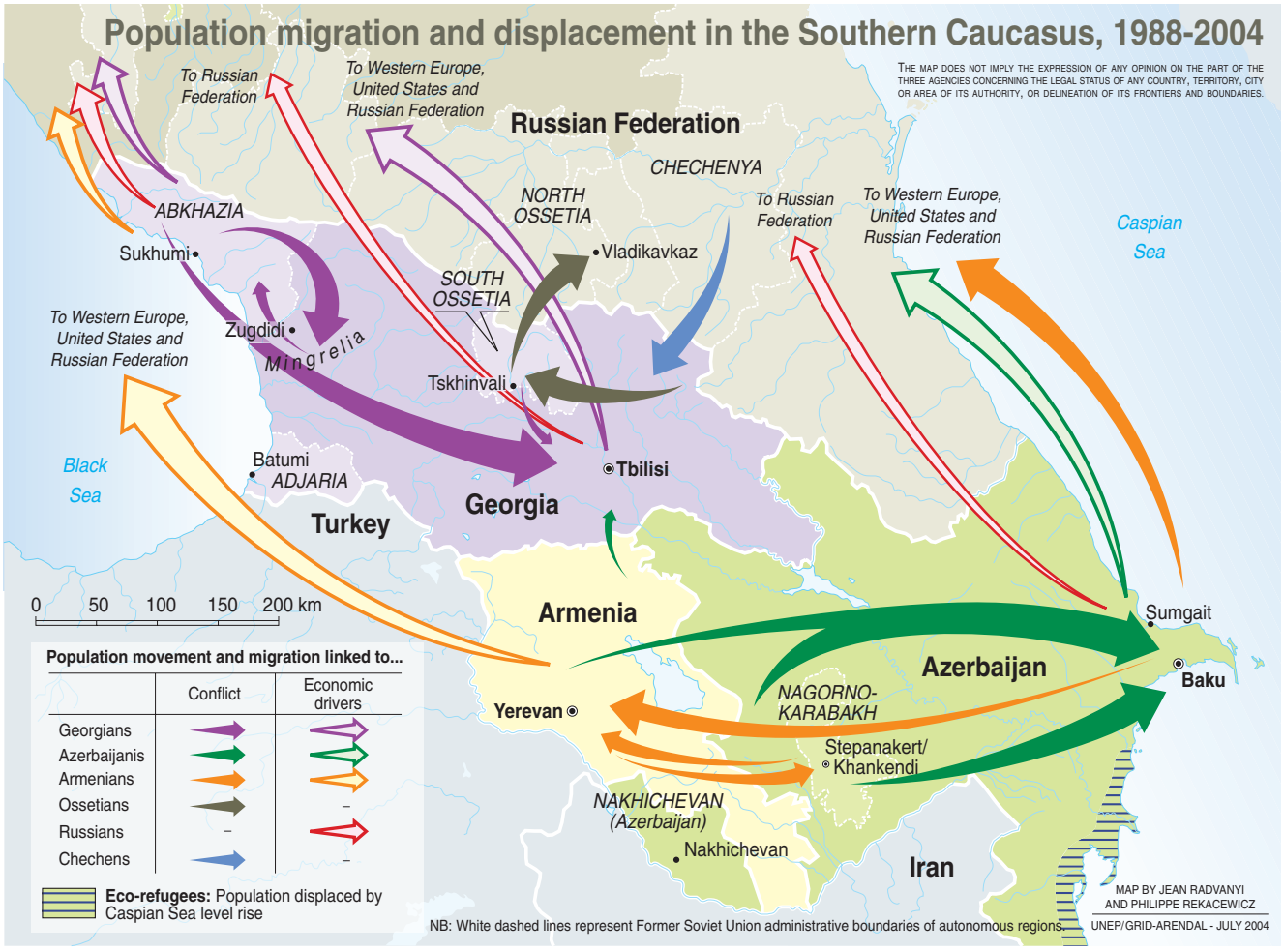
Social and Environmental Issues

From a total population of 16 million in the Southern Caucasus in 1991, about 3-4 million people have left for other countries in the past decade. Of the remaining inhabitants, roughly half live in Azerbaijan and the remainder is divided between Georgia and Armenia, with current populations (2003) of roughly 4.5 million and 3.3 million, respectively.[7] According to UNHCR, many refugees and Internally Displaced Persons (IDPs) have remained in the Southern Caucasus, with more then 600,000 in Azerbaijan (1 million according to information provided by the Azerbaijani Government), about 270,000 in Georgia and some 250,000 refugees in Armenia.[8] These IDPs and refugees are the segment of population most vulnerable to poverty, suffering in particular from the related consequences to their health and education.[9]

Conflict and population movement have increased ethnic homogeneity in many parts of the Southern Caucasus. In some instances, minorities remain only loosely integrated within state structures, and their rights are weakly protected.[10]

The slowdown of industry throughout the region in the wake of the Soviet demise has led to a short-term reduction in environmental pollution in some areas. Nevertheless, Soviet industrial legacies continue to pollute significant areas, threatening the health of many. In Armenia, high levels of air, water, and soil

7. UNICEF 2003. TransMONEE Database. Available at: www.unicef-icdc.org/resources/transmonee.html
8. UNHCR, www.unhcr.ch.
9. Cornell *et al*. 2002. *The South Caucasus – A Regional Overview and Conflict Assessment*. Prepared for the Swedish Agency for International Development Cooperation (SIDA), September 2002: www.cornellcaspian.com/sida/sida.html
10. Matveeva, A. 2002. *Profile – The South Caucasus: Nationalism, Conflict and Minorities*. Minority Rights Group International. London. www.lgic.info/media/downloads/southcaucasus.pdf



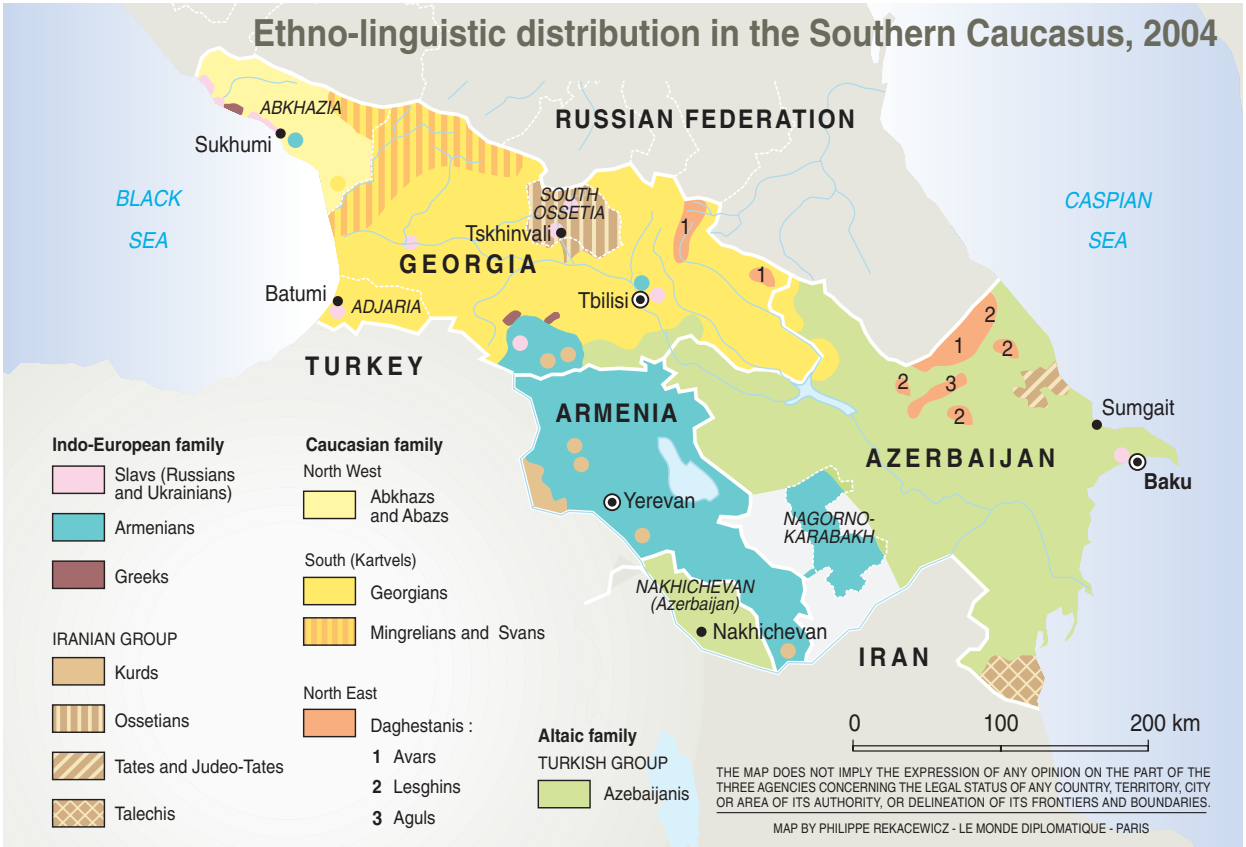
pollution from former industrial and agricultural producers are of principal concern. In Azerbaijan, industrial pollution, soil degradation, deforestation and trans-boundary water pollution affect public health. In Georgia transportation-related urban air pollution as well as soil and water pollution from pit mining operations, and poor water and sewerage systems pose a significant threat to the environment and to human health.[11] Across the industrial centres and capital cities of all three countries, respiratory and cardiovascular diseases linked to environmental pollution are issues of significant concern.[12]

Household energy needs and commercial interests drive illegal logging and deforestation. Productivity of agricultural lands is threatened by over-cultivation and salinization, a consequence of the failure to maintain irrigation and drainage systems. Pollution of rivers and coastal areas is impacting the health of all the countries' populations, hampering coastal development and tourism.

The people of the Southern Caucasus have long been vulnerable to natural hazards and especially to devastating earthquakes. In combination with the growth of industrial and energy infrastructure, these natural hazards threaten to have significantly greater environmental impacts particularly for environmentally sensitive areas such as watersheds and national parks unless appropriate safeguards are implemented.

11. South Caucasus Health Information Project 2000. Improving Human and Environmental Health in the South Caucasus. A Brief to the Standing Committee on Foreign Affairs and International Trade (SCFAIT). www.csih.org/what/schip/schipbrief.html. See also: "National Environmental Action Plan 2000, MoE of Georgia. Technical Assistance with Development of an Air Quality Management Plan and Health Effect Study for Tbilisi", final report, August 2002, AEA-Technology, UK & Ministry of Environment of Georgia.

12. UNEP GRID-Tbilisi. Caucasus Environment Outlook, 2002.



"Economic decline, civil conflicts, natural disasters and the emergence of refugee and internally displaced population problems have increased poverty levels … [and] … led to illegal logging, over-grazing, [and] hunting, … with consequent demands on natural resources."

Regional Review: economic, social and environmental overview of the Southern Caspian oil and gas projects. www.caspiandevelopmentandexport.com/ASP/Home.asp

Environment and Security priorities in the Southern Caucasus

From a security perspective, the sources of instability in the Southern Caucasus can be divided into two categories. The first is the continuous dangers stemming from the conflicts inherited from the Soviet collapse. These include the Georgian-Ossetian and the Georgian-Abkhaz conflicts and the conflict between Armenia and Azerbaijan based on territorial claims over the Nagorno-Karabakh region that has caused an outflow of refugees and internally displaced persons from the region as well as the disruption of political and economic ties between conflicting countries. These include as well the dangers of spill over from the unstable regions of the Northern Caucasus to the Southern Caucasus.

The second category of sources of conflict, or 'new' dangers, are those resulting from shifts in the political landscape, where increasing tension between the 'haves' and the 'have nots' within each society may lead to civil strife. These new polarisations on socio-economic lines could have a regional dimension, and become a new source of instability across the Southern Caucasus.

From an environmental perspective, the Southern Caucasus countries are striving today to overcome the ecological consequences of the Soviet period, while regenerating their economies and addressing contemporary and future environmental concerns. These include managing the impacts of rising industrial production, adapting to climate change and regulating new technologies such as Genetically Modified Organisms. To revitalize their economies in an environmentally sensible way, they need to target investment in cleaner production technologies, and in high value-added industries such as wine cultivation, while strengthening their waste management capacities.

How are environment and security linked in the Southern Caucasus? On the one hand environmental degradation in zones of conflict and lack of information about the state of the environment could hamper the peace processes. On the other hand, the upturn of economic productivity could increase tension over the renewed pollution, or over access to natural resources such as clean water, soil and living space. As a result of these environmental pressures, social polarisation and internal struggle could become more acute.

On the basis of stakeholder consultation and the national assessment reports, the following linkages between environmental stress and social tension have been identified in the Southern Caucasus:

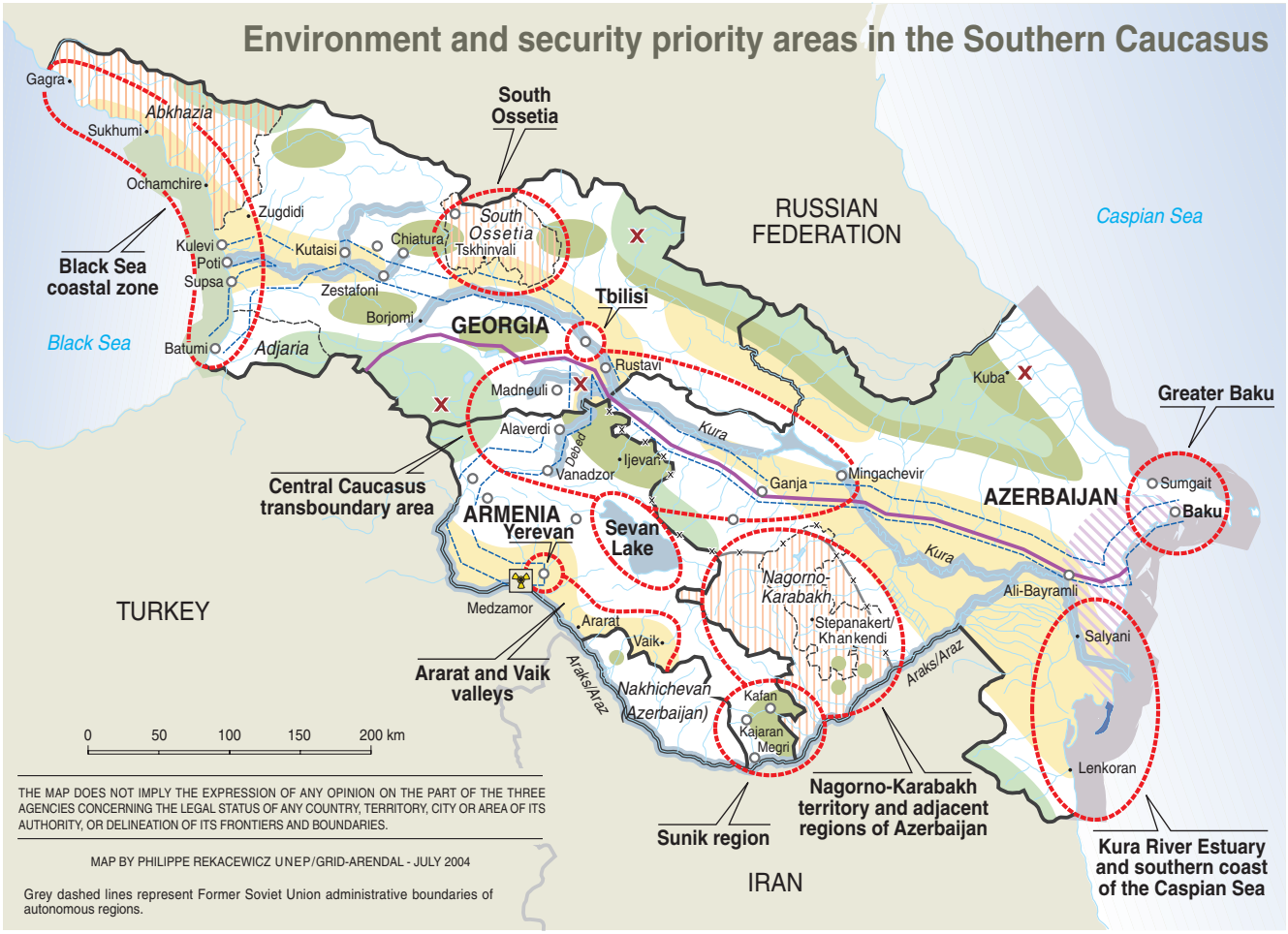
- Environmental degradation and access to natural resources in areas of conflict
- Management of cross-border environmental concerns: cross-boarder water resources, natural hazards, and industrial and military legacies
- Population growth and rapid development in capital cities

The geographic areas identified as being of greatest priority are represented in the map on "Environment and security priority areas in the Southern Caucasus".

The issues and sites highlighted can be addressed either through governance or through technical activities that engage civil society and scientists from each of the Southern Caucasus countries. However, any major event within one country, including one generated by environmental factors, could have a negative impact on the regional security situation.

Environment and Security Priority 1: Environmental degradation and natural resource access in areas of conflict

Environmental degradation and the use of natural resources are identified as factors that could deepen contention in areas of existing conflicts as in Abkhazia, South Ossetia, and Nagorno-Karabakh and adjacent regions of Azerbaijan. Apart from the central territorial question, another source of rivalry is contrasting information on extraction of natural resources from these areas under the cover of conflict. It has been alleged that minerals, forests and other lands are being exploited thus adding an environmental tension to existing conflicts over these territories. Limited monitoring and management in these regions has allowed the environmental question to be politicised. The local population and governments would benefit from an independent assessment of the state of the environment in these conflict areas.



Environment and security priority areas

Land degradation

- Soil degradation: contamination due to high levels of pesticides and/or heavy metals (mainly inherited from the Soviet period), salinization and erosion due to poorly maintained irrigation system and rise of water table
- Area affected by deforestation
- Pastures degraded by overgrazing
- Arable land degraded by oil exploitation

Water pollution

- Transboundary and domestic polluted waters
- Coastline and infrastructures affected by sea level rise, and oil pollution
- Coastline affected by bacterial or nutrient loading and coastal erosion

Infrastructure

- Ageing Soviet industrial complex, mining centre or processing plant (oil terminal, refinery,...) major source of air, soil and water pollution
- Nuclear power plant
- BTC (Baku-Tbilisi-Ceyhan): oil pipeline route
- TRACECA (Transport Corridor Europe Caucasus Asia) : Renovated or new multimodal transportation corridor (road, railroad, pipeline)

Security issues

- Former Soviet Union administrative boundaries of autonomous regions. (South Ossetia and Nagorno-Karabakh have been officialy disbanded)
- Areas of conflict out of control of central authorities
- Line of contact
- X Areas vulnerable to ethnic or political tension
- x x x Concentration of landmines

Additional security concerns in the areas of conflict are the use of landmines on frontlines, and sporadic clashes by soldiers bearing light arms. Every year, mines and sniper fire result in death and injury. Large areas of land are rendered inaccessible to the local population, leading to reduced land use, loss of livelihoods and displacement. The militarised situation also hampers waste management and disposal, and the maintenance and renovation of irrigation and hydro-electric dams, constraining economic growth.

Environment and Security Priority 2:
Management of cross-border environmental concerns

Cross-border water resources
The quality and mechanisms for sharing transboundary water resources – both surface and underground – are key concerns for all three countries.

The Caspian and Black Seas are vital to the economies of the Southern Caucasus countries. Crossing borders and jurisdictions, these seas are both impacted by developments within the Southern Caucasus, and by developments outside this region. These seas are not highlighted at the regional level within this report on three grounds. Firstly, this report focuses on those resources that fall within the boundaries of Armenia, Azerbaijan and Georgia. Secondly, international security concerns are implicit within the processes designed to strengthen transboundary environmental management of these seas – the Caspian Environmental Program[13] and the Black Sea Commission/Black Sea Environmental Programme[14]. Lastly, the management of the Caspian Sea is of greatest concern to Azerbaijan, and for this reason it is dealt with in the national review that follows this section.

The Kura-Araks/Araz river system, by contrast, is an essential source of fresh water for all three Southern Caucasus countries. Azerbaijan is particularly dependent on the Kura-Araks/Araz for irrigation and for potable water for more than half of its population. Shared management of these rivers is therefore a fundamental issue for regional security. International organizations and donors (UNDP, World Bank, EU, USAID, OSCE, NATO, SIDA and others) are already working with the countries in developing integrated basin management projects, including joint monitoring of transboundary water resources.

Natural hazards
Another important regional environment-related security consideration is vulnerability to large-scale natural hazards such as earthquakes, landslides and floods. The Southern Caucasus has been particularly devastated by earthquakes (e.g. 1988 and 1998) and has regions of continuously high seismic activity. The region is vulnerable as well to the potential increase in the intensity and frequency of extreme weather events. A strategy for adaptation to climate change grounded in analysis of vulnerability of the different sectors of the economy is needed.[15]

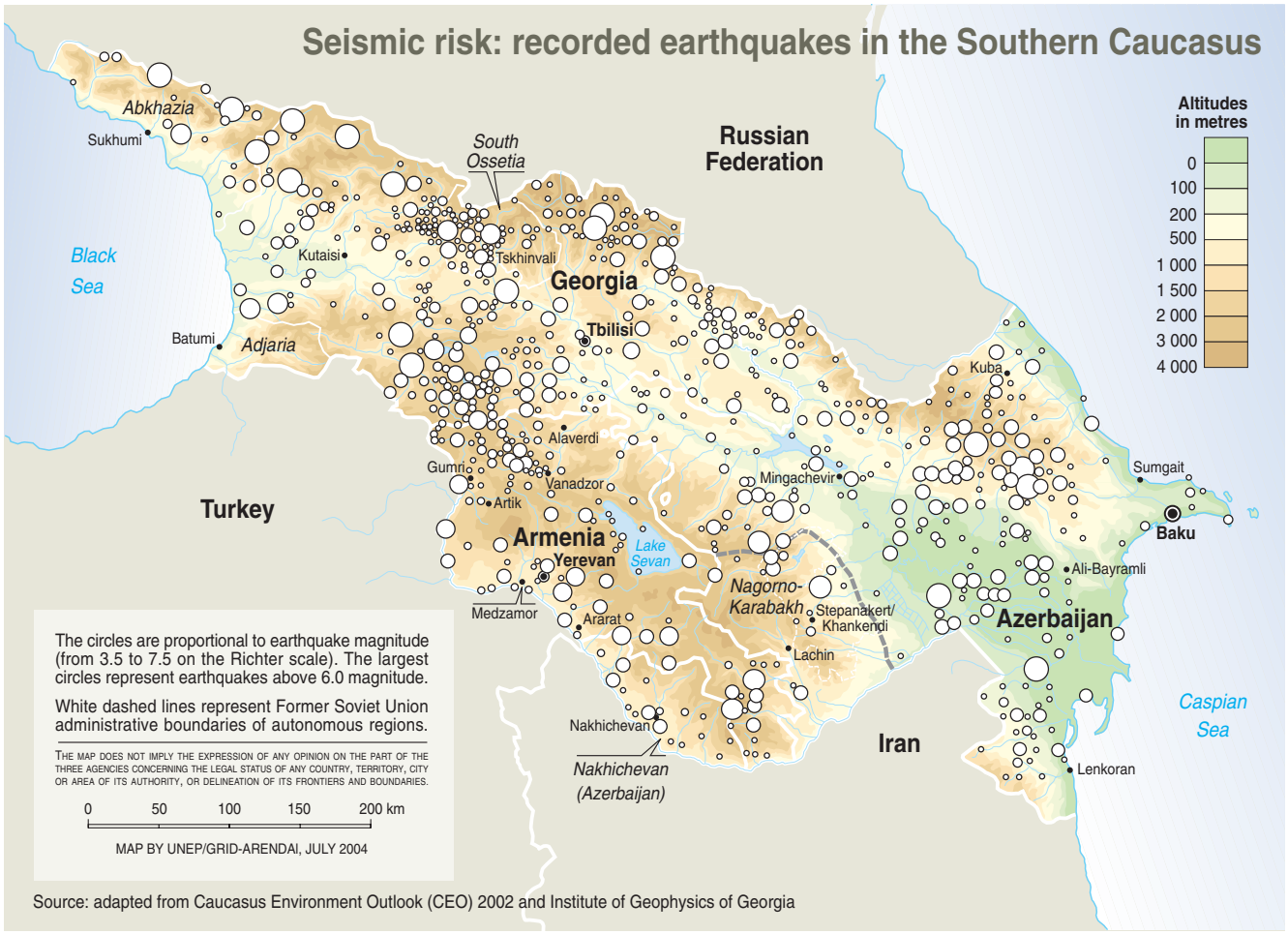
Apart from local tragedies such as landslides and destruction of critical infrastructure, natural hazards may impact on the larger region through the release of pollution from damaged industrial plants, waste water treatment facilities, oil transportation routes, power generation facilities and nuclear fuel and waste storage sites. The international community has voiced particular concern for the safety of the Medzamor nuclear facility in this regard.

An additional concern is landslide. In the sensitive arid environment of southern Armenia and Azerbaijan, deforestation, water scarcity and land degradation place the population under acute stress. These regions struggle with unemployment and energy shortages, contributing to the systematic deforestation and erosion of this mountainous terrain and increasing the danger of landslides for both countries. The international community can offer broad assistance in all aspects of disaster reduction and adaptation to climatic variability.

Industrial and military legacies
Partly closed mining sites and industrial complexes inherited from the Soviet period remain important sources of pollution. Likewise, disposal of abandoned Soviet weapons, chemicals and reclamation of contaminated lands are important challenges for the Southern Caucasus countries. The Araks/Araz River, a critical source of freshwater for the regions between Armenia and Azerbaijan – Sunik and Nakhichevan, is similarly threatened by urban and industrial waste, putting inhabitants on both sides of the border at risk.

Infrastructure degradation is a particularly sensitive transboundary issue if it reinforces existing group divides. In the border regions of Lori-Tavush in Armenia, Marneuli and Gardabani in Georgia, and Kazakh and Tavuz in Azerbaijan, maintenance of joint irrigation dam systems has been neglected, threatening the collapse of the dams and release of reservoirs. This endangers not only downstream villages, but could also generate wider political problems between the neighbouring countries.

13. www.caspianenvironment.org
14. www.blacksea-commission.org
15. Georgia's Initial National Communication Under the United Nations Framework Convention on Climate Change prepared under the UNDP/GEF-Government of Georgia Project GEO/96/G31; The special Bulletin of the WMO "Operational Provision for the Hydro meteorological Safety of the Transport Corridor Europe-Caucasus-Asia (TRACECA)".



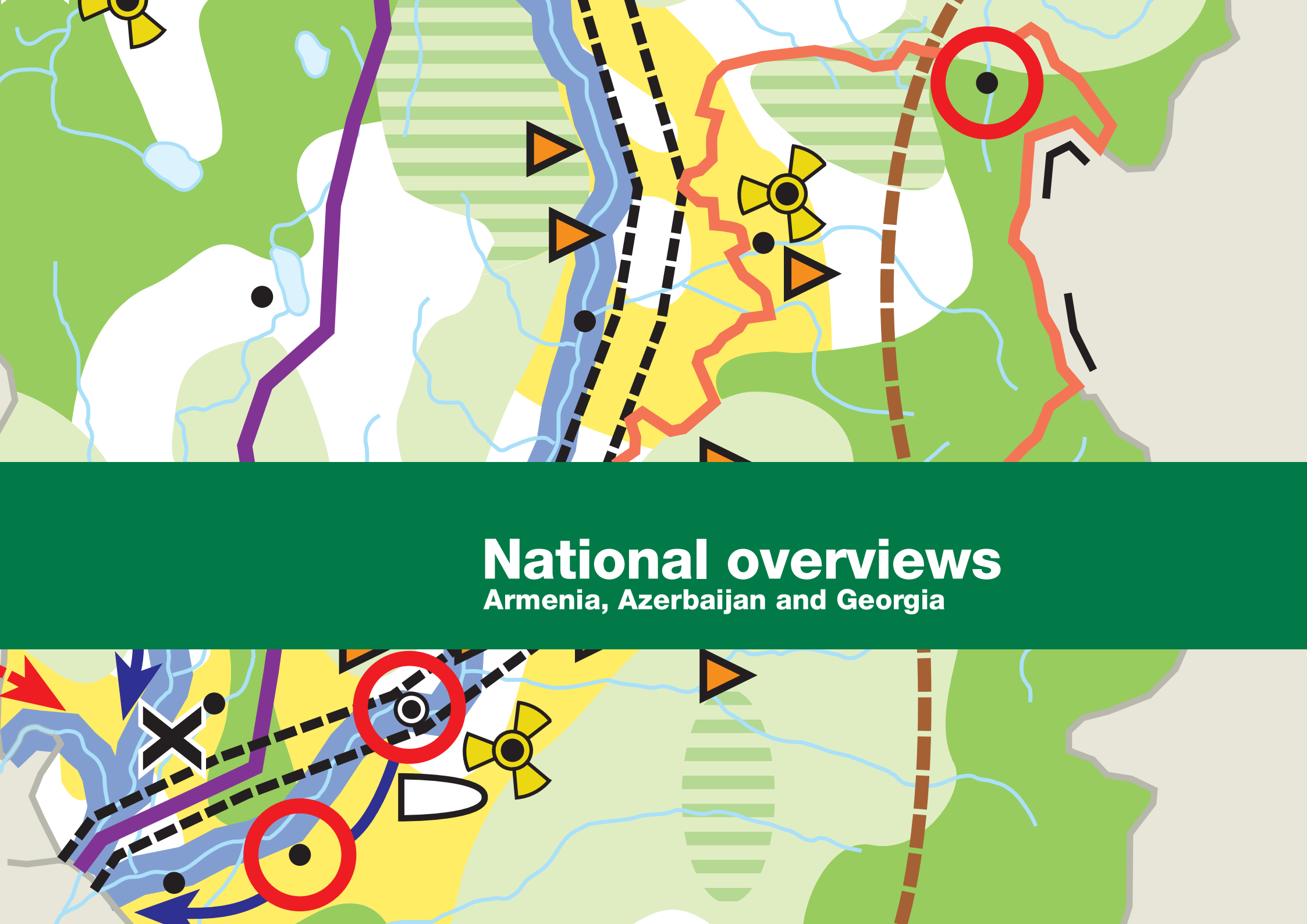
Source: adapted from Caucasus Environment Outlook (CEO) 2002 and Institute of Geophysics of Georgia

Environment and Security Priority 3:
Population growth and rapid development in capital cities

Unmanaged growth of the population in the three capital cities is outpacing urban infrastructure capacity in terms of waste management, water supply and transportation, with serious consequences for local health and welfare. It is also generating pressures, which, if coupled with internal tensions, risk broader spill over in the form of violence and criminality.

Migrants to the capital cities include Internally Displaced Persons (IDP) and refugees of past conflicts and natural disasters; permanent and temporary workers from rural areas, and unemployed groups from secondary urban centres searching for work and better living standards. Many recent arrivals are housed in temporary accommodation and frequently lack employment and access to mechanisms for social integration. Some are compelled to seek shelter in abandoned industrial sites. There has been an increase of illegal building and industrial production, with air pollution clearly visible though insufficiently monitored. Urban planning, traffic management and enforcement of building standards are limited, threatening future economic growth and increasing vulnerability to disaster.

A lack of public funds for infrastructure in all three countries means that city sewerage systems remain inexistent or dilapidated; and water treatment and waste collection are insufficient to meet exiting needs. Though none of the capital cities is plagued by systematic inter-group violence, there is increased competition for available employment and resources. While migration from the countryside to the capital cities continues and is perhaps accelerated by rural desertification, basic urban environmental infrastructure – water supply, sewage, green space – lags behind the rising demands placed upon it. Unable to meet their expectations for a better life, economic migrants must share the capital city with the emerging wealthy class, potentially generating dissatisfaction and frustration.



National overviews

Armenia, Azerbaijan and Georgia

National Environment and Security reviews

Environment and Security review: Armenia

Armenia is the smallest of the former Soviet republics, with a surface area of 29 thousand square kilometres hosting three million inhabitants. Landlocked and largely mountainous, its main population and agricultural centre is the Ararat Valley in the west, 800 metres above sea level. Armenia has a dry, continental climate in the Ararat Valley and the southern regions, with a milder climate in the forest-covered mountainous regions to the northeast.

The country is vulnerable to earthquakes. The most recent major shock was the 1988 Spitak earthquake that killed 24,000 people, levelled three major urban centres in northern Armenia, and destroyed a third of the country's industrial capacity.

Armenia gained its independence in 1991, while involved in conflict with its neighbour to the east, Azerbaijan. Its access to markets was hampered by the underdevelopment of transport networks or impeded by the ongoing conflict and this combined with the collapse of the Soviet-era economy led to a severe crisis. The economy collapsed, industrial and agricultural production falling by half in the space of a single year, sparking a wave of emigration.

In the decade that followed independence, Armenia recovered substantially. Today the country must manage not only the Soviet legacy, but also the impacts of its economic upturn, implementing policies that protect the environment and natural resources while consolidating its economic gains.

Assuring Energy Security and Achieving Environmental Sustainability

Armenia's main environmental dilemmas stem from the landlocked nature of the country, and its lack of energy resources. These factors have shaped water management and environmental decision making since Soviet times. They have also generated internal and external tensions over risks to health and to the ecological balance of the country. Particular examples include the drawing down of Sevan Lake for hydropower generation, and the construction of a nuclear power plant at Medzamor, the only such plant in the Southern Caucasus.

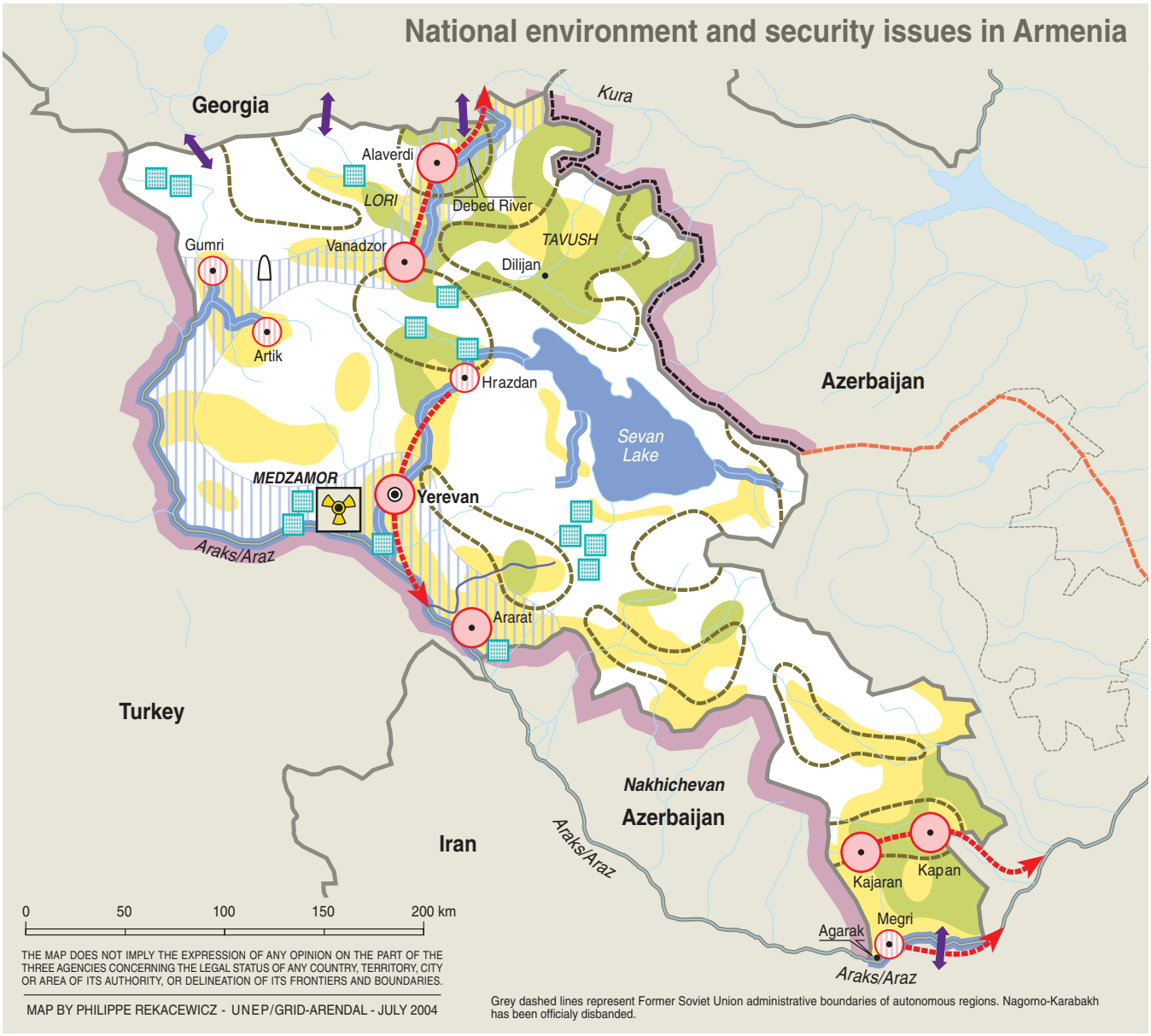
During most of the 1990s, and as a result of the energy crisis, the water of Sevan Lake was used to generate electricity through the hydroelectric plants constructed over Hrazdan waterfalls. As a result of diversion of Sevan waters for irrigation and power generation, the level of the lake dropped by 18 metres in the 1960s-70s, with serious consequences for ecological integrity. Under the pressure of Armenian intellectuals and public figures in the 1970s, the Soviet authorities made efforts to preserve the lake, and diverted the Arpa River to flow to the Sevan. Since 2001, as a result of unusually heavy rainfall, management requirements for hydroelectricity generation, and channelling of additional flows from the Arpa-Sevan and Vorotan-Arpa tunnels, the level of the lake rebounded between 1-2 metres. All the same, it remains far below its historical levels.

Sevan Lake also suffers from the lack of waste water treatment systems in the villages and towns surrounding it. Increasing tourism to its shores during the hot seasons has increased the presence of solid waste in the area due to the lack of disposal systems and the lack of environmental consciousness among the visitors. The state of Sevan Lake is an issue of national pride, and its mismanagement can provoke dissatisfaction with the government.

Only 28 kilometres west of the capital city of Yerevan, the nuclear plant of Medzamor is a matter of international concern, affecting Armenian relations at the regional and international levels. The plant was first closed on environmental grounds in 1989 in the wake of the Spitak earthquake. In the 1990s, however, the supply of gas from Azerbaijan and Georgia became irregular, resulting in power shortages that deepened the severity of the economic crisis. Energy policy consequently needed rethinking, and the earlier closure of this nuclear power plant was reversed. Unit Two of Medzamor was reopened in 1995, subject to regular monitoring by the International Atomic Energy Agency. Today, nuclear energy constitutes 36% of electricity production in the republic. The Medzamor plant is financially managed and fuelled by Unified Energy Systems of Russia (YeS Rosii). Its closure, planned for 2004 as part of a broader accord with the European Union, has been deferred in face of the lack of viable alternatives for supplying the nation's electricity. The Medzamor nuclear power plant is therefore not only a primary source of electricity for Armenia, but also perceived to be a great concern for its security and that of its neighbours.

Environmental Consciousness and Soviet Heritage

Controversies related to energy policy were central to the emergence of environmental consciousness in the Soviet years. Another subject of protest was the pollution caused



Mines and Industrial activities

- Large ageing Soviet industrial complex still generating pollution (mines, chemical and cement factories, thermal and metallurgical plants). Significant heavy metal contamination (soil and water).
- Smaller ageing soviet industrial complex representing a significant source of pollution.

Water issues

- Polluted waters and ecosystem due to industrial and agricultural effluents, and untreated waste water.
- Significant wetland under threat
- Domestic pollution sources that affect neighbouring countries
- Polluted groundwater

Land degradation

- Soil degradation and erosion: Pollution due to pesticides and/or heavy metals (mainly inherited from the Soviet period). Salinization due to poorly maintained irrigation systems
- Area affected by deforestation
- Area at risk of landslides

Security issues

- Border closed
- Border tensions, and landmines in some places
- Line of contact
- Jet fuel toxic waste
- Nuclear power plant
- Major transportation links crossing borders between Armenia and other countries

"Armenia is committed … to bring about a region where cooperation will replace confrontation, where confidence of trust between people will underpin agreements between governments, where borders are bridges not walls and obstacles."

Statement by H. E. Mr. Vartan Oskanian Minister of Foreign Affairs of the Republic of Armenia 11th Meeting of the OSCE Ministerial Council, December 01-02, 2003, Maastricht, The Netherlands. www.armeniaforeignministry.com/speeches/031201oskanian_obse_arm.html

by industrial facilities in or near urban centres. The development of chemical and metal production facilities, such as the Nairid synthetic rubber plant in Yerevan, required the massive import of raw materials. These were widely and publicly criticised. By the late 80s, an active ecological movement was growing in Armenia, and several demonstrations were organised in 1987 calling for the closure of these facilities.

A great part of the Soviet industrial base has been closed or operates at levels below that of former times. Examples include the copper mines at Alaverdi and the molybdenum mines at Kajaran, and Megri. But they continue to be important sources of pollution because neither the facilities nor the waste disposal sites were properly secured. Other facilities continuing to function, such as the copper mines of Kapan, do so with uncertain environmental safeguards in place.

Today, there is no influential green party on the national political scene, though some mainstream parties do raise environmental concerns. Nevertheless, there is growing sensitivity towards ecological issues, with deforestation trends and reduction of green areas in urban settlements figuring in public debate. With some looking to reopen chemicals production facilities, it would be timely to implement and enforce stricter environmental management and disposal standards.

Preserving the environment in a time of tension

Armenia's first decade of independence has been affected by the Nagorno Karabakh conflict, by the inflow of refugees and outflow of ethnic Azerbaijani refugees and Armenian migrants. Strengthening the capacity of the state and the society to manage conflicts, including in the field of the environment can enhance its future stability.

Tensions across borders could be increased by environmental hazards such as downstream river pollution, or by population movements driven by local catastrophes. With its land-locked position and already complex relations with Azerbaijan and Turkey, the Armenian government needs to bring industries responsible for pollution under close scrutiny in order to prevent their adding to tensions at the regional level.

The economic crisis and limited access to external markets, as a consequence of the unresolved conflict with Azerbaijan, has increased pressure on arable lands and on forest ecosystems. The need to achieve agricultural self-sufficiency in the Ararat Valley has required that farmers intensify their withdrawal of limited groundwater supplies, threatening the long-term reliability of this critical resource. Without dependable sources of energy, inhabitants of several regions have turned to the forests to meet their heating needs. Incidents of illegal export of timber were also recorded. As a consequence, over the last decade the surface of Armenia covered by forests decreased from 13% to 8%. While the northern forests may regenerate naturally, the massive deforestation of the fragile semi-arid forests to the South may have longer-lasting impacts, with serious consequences for inhabitants in these areas. The resulting desertification is a threat not only to the environment but also to the economy as well in a country where agriculture makes up 35% of the Gross Domestic Product, and employs 38% of its workforce.

The loss of arable lands linked to the mismanagement of land cover and soil could accelerate migration from mountain villages to foreign countries, and to major cities such as Yerevan. Urban migration will increase pressure on cities, through increased air pollution, unregulated and mismanaged construction, and could result in the creation of "misery belts" around the capital city.

In the past, state institutions proved ineffective or unwilling to resolve environmental problems, and the social tensions caused by them. As in the past, post-independence Armenia suffers from a lack of natural resources and of access to open seas, a situation that increases the stress on natural resources.

Environment and Security Priorities

Sevan Lake: A history of public activism linked to national emotion, competing demands for this lake's water, and rising pressures from tourism, make the ecological integrity of Sevan Lake an important concern. The stabilisation of the lake level, strengthened management of the shore zone, and the implementation of sewage treatment and solid waste management in the area, can contribute to reinforcing the political legitimacy of the state.

Lori-Tavush Region: The Soviet legacy of polluting industrial complexes has made this region another hot spot. Though

limited in scale, mining and metallurgical activities, such as in Alaverdi, pollute the Debed River. Water pipes are obsolete and leaking. In the wake of torrential rains there are instances of contamination of drinking water by sewage water, undermining public health in Alaverdi City. Maintenance of joint irrigation systems in the region has been neglected, threatening nearby settlements downstream.

Yerevan, and the Ararat and Vaik Valleys: The capital city of Yerevan is developing in rapid strides, which could have consequences for the environment and for social tensions. The city's population is increasing as a result of the influx of migrants and rural workers seeking economic opportunities. The shift of public transportation from mass transit to microbuses, the resulting increase in car traffic and the increase in unregulated construction projects are sources of concern. Similarly, the rise in construction has led to the destruction of old, private houses, as well as parks and green areas. The growth of the greater city area is having direct impacts on the environment of the whole of the Ararat Valley, where half the country's population lives. The land and water quality in the valley is a major concern. Mass usage of pesticides in the Soviet era continues to pollute land and water, while lack of maintenance of the irrigation drainage system is intensifying salinization of the soils. The overuse of groundwater resources, and lack of information about it, is yet another source of concern.

Sunik Region: In the area around Agarak, mining activities in Kajaran, Megri and Kapan provide an important source of income, despite their reduced productivity when compared to Soviet levels. At the same time, the severe pollution that goes into Araks/Araz River they generate has not been reduced. The population is extremely poor and usually cannot afford health care. Iran has in the past complained about transboundary pollution from extensive opencast mining in this area. Deforestation is also important because these dry forests have limited capacity for regeneration.

Environment and Security review: Azerbaijan

Azerbaijan forms the eastern end of the Southern Caucasus. It opens onto the Caspian Sea, a body of water more akin to a lake than a sea. Apart from the sub-tropical area around Lenkoran and from the mountainous parts, most of the country (total area 86,600 sq km) enjoys various forms of moderately dry continental climate. Fragile forest and sub-alpine vegetation surrounds the Kura plain in the Greater and Lesser Caucasus. The most extreme climate is found in the semi-arid steppes of the Kura plain and in the Apsheron peninsula. Management of water resources is consequently an issue of national and international concern, as the water supply to most of the population comes from catchment areas located in neighbouring states.

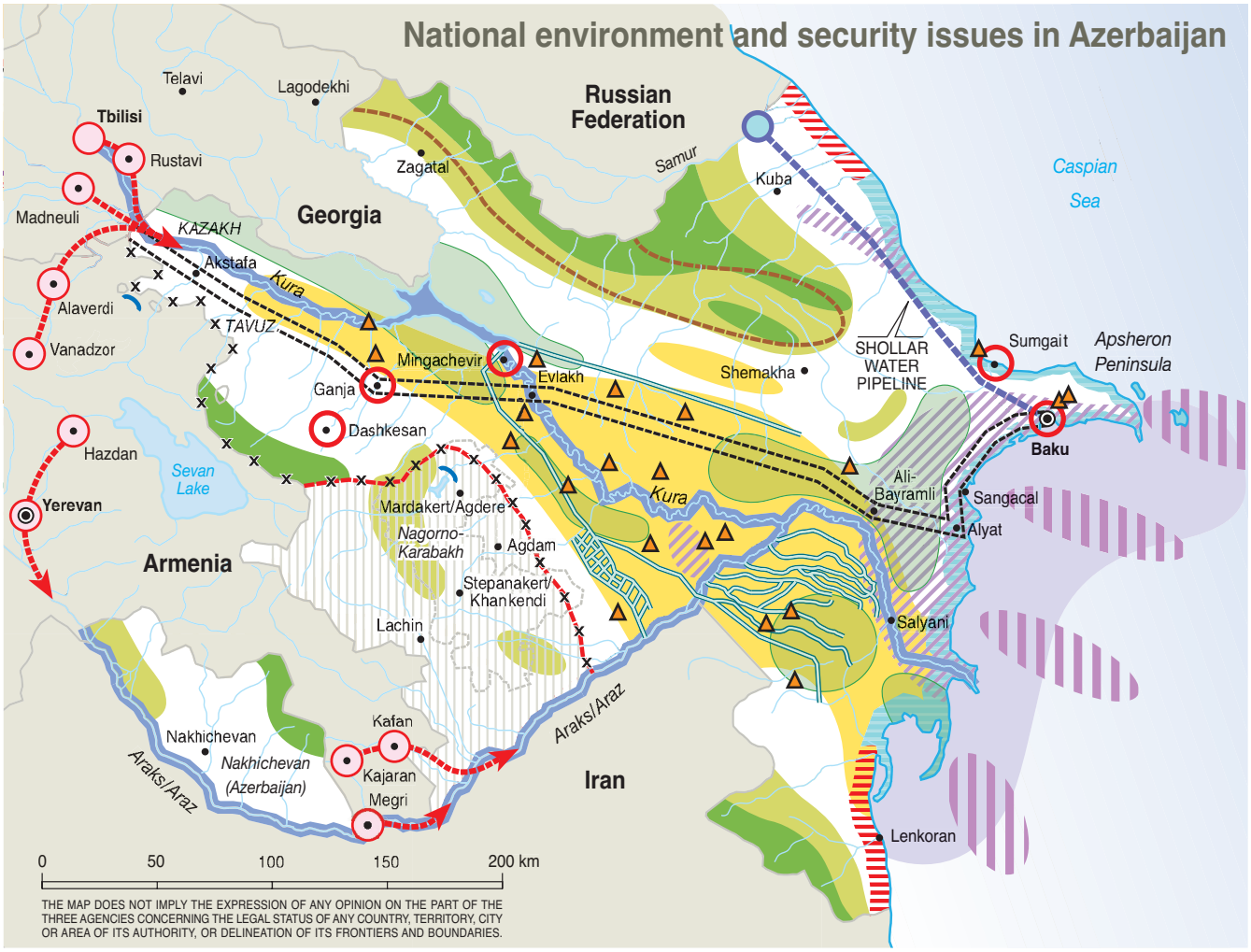
The whole of Azerbaijan is located in a high-risk seismic zone. Global warming could further accentuate the risk of natural hazards, increasing the frequency of natural processes such as avalanches, mud and landslides, recurrent threats to inhabitants in the area. Mitigating such risks is complicated by the fact that Azerbaijan is not in full control of parts of its territory, due to the Nagorno-Karabakh conflict.

Controlling the Environment[16]

The Caspian Sea is of crucial importance to Azerbaijan's security and environment, yet competing uses and contested demarcation of this international water body impede efforts at sustainable management and exploitation for long-term economic benefit.

For almost 150 years, oilfields exploited on land and offshore in the Caspian Sea have been the country's prime source of income, the driving force behind its growth and a main source of its pollution. The Caspian Sea is also a major asset for leisure and tourist activities. The Sea is furthermore an invaluable source of income from the fishing of sturgeon for caviar, but all the species are now threatened by over-fishing and pollution of the basin. Water levels have risen by about 2.5 metres since 1977 and seem to be rising again, making the upkeep of shore facilities – transport networks, beach amenities and oilrigs – increasingly difficult.

16. The figures used in this section are from quarterly reports on Armenia, Azerbaijan and Georgia from The Economist Intelligence Unit, London, different years.



Pollution due to oil production and industrial activities

- Soils contaminated by pollution from oil production
- Obsolete Soviet drilling platforms threatened by Caspian Sea level rise.
- Dispersed oil pollution
- Large ageing Soviet industrial complex still generating pollution (mines, chemical and cement factories, thermal and metallurgical plants). Significant heavy metal contamination (soil and water).

Water issues

- Transboundary polluted waters

Caspian Sea level rise

- Coastline already submerged (destruction of certain infrastructure)
- Coastline at risk of flooding
- Drinking water canal
- Tension between Russian Federation and Azerbaijan due to diversion of water from Samur River
- Decaying Soviet irrigation infrastructure damaging soil
- Poorly maintained dam threatening downstream communities
- Water pollution sources outside of Azerbaijan

Land degradation

- Soil degradation and erosion: pollution due to pesticides and/or heavy metals (mainly inherited from the Soviet period). Salinization due to poorly maintained irrigation system and rise of water table
- Area affected by deforestation
- Area at risk of landslides

Pasture degraded by overgrazing

- Summer pasture
- Winter pasture

Security issues

- Districts out of the control of Azerbaijani authorities
- Line of contact
- xxx Concentration of landmines
- Refugee camps or settlements

Transportation and communication

- TRACECA (Transport Corridor Europe Caucasus Asia) : Renovated or new multimodal transportation corridor (road, railroad, pipeline) and BTC (Baku-Tbilisi-Ceyhan): main oil pipeline route

Grey dashed lines represent Former Soviet Union administrative boundaries of autonomous regions. Nagorno-Karabakh has been officialy disbanded.

MAP BY PHILIPPE REKACEWICZ - UNEP/GRID-ARENDAL - JULY 2004

These issues require the adoption, at both the national and international levels, of measures encouraging careful use of natural resources. International economic and scientific interaction is needed to secure sustainable replenishment of marine wildlife, particularly sturgeons. In order to develop tourism, increasingly strict environmental standards need to be introduced and applied in the oil and petrochemical industries and in the cities bordering the sea. In response, the five states with Caspian Sea shoreline have concluded an agreement delineating basic principles for effective management of the Sea and its resources – the Framework Convention for the Protection of the Marine Environment of the Caspian Sea and have further adopted a common Strategic Action Programme. The marine borders between the states, and the international legal status of the Sea, remain an issue of negotiation.

Most residential, agricultural or industrial water users in Azerbaijan draw water from one of three rivers, all of whose catchment areas are located outside the country. Controlling freshwater quality consequently is an issue of transboundary cooperation, affected by the Nagorno-Karabakh conflict and by the need to deal with the legacy of Soviet industrial policy.

Among the primary sources of water for Greater Baku is the Shollar pipeline, built in 1917, carrying the waters of the Samur River nearly 170 kilometres to the capital city. Largely free of industrial or urban pollution, the Samur River is the subject of several proposals for hydroelectric development. Any modification of the Samur's flow regime nevertheless would require the agreement of the Russian Federation, and could impact this vital source of urban drinking water. The entire network of water diversions supplying Greater Baku with drinking water is consequently in need of refurbishment. In particular, existing equipment needs to be renovated and separated from networks serving agriculture and industry.

The quality and use of the Kura and Araks/Araz rivers are key concerns. In both cases there are large urban and industrial areas upstream, notably the capital cities of Armenia and Georgia. Treatment of urban effluent is either inadequate or non-existent. Large industrial facilities set up under the Tsar and subsequent Soviet regime (Rustavi, Alaverdi, etc.) have been closed or have reduced their operations, but their waste, equipment and stocks have not been adequately secured. They are therefore still polluting nearby rivers. Several mining sites, most notably the Madneuli and Zangezur mines, continue to operate. With international groups seeking to purchase these projects, effective measures to protect public health should be implemented.

The Nagorno-Karabakh territory and adjacent regions of Azerbaijan uncontrolled by the Azerbaijani Government, pose specific problems. Refugees and Internally Displaced Persons pose a considerable challenge to the rest of the country, adding to existing environmental pressures. They also affect the Azerbaijani job market, swelling the ranks of the unemployed. Rich farming land lies untilled. Large areas of summer pasture have been closed off to herding communities, meaning that other areas in the Greater Caucasus are being over-grazed. There is growing concern about the long-term impacts of overuse of pasture, clearing of forestlands, stockpiling of waste, and irrational use of land in Nagorno-Karabakh. Only detailed studies of the area, under the aegis of international organisations, can dispel these fears. A study of this kind could also pave the way for more rational use of water resources between Upper and Lower Karabakh.

With its continental dry climate, the Nakhichevan region of Azerbaijan constitutes a particular case of its own. Although integrated in the political life of the country, it is geographically cut off. The difficulty of exchanges with the main part of Azerbaijan caused by the unresolved conflict between Armenia and Azerbaijan further complicates the management of environmental issues – deforestation, degradation of hills slopes and arable land – affecting a population already in a difficult predicament.

Diversifying the economy while preserving the environment

After the collapse of the Soviet Union, numerous factories in Azerbaijan either closed or substantially reduced their activity, increasing unemployment across the country. The recent boom has substantially increased the country's ability to cope with the social, economic and environmental challenges it faces but it has had to step up measures to protect the environment and regulate activities.

Azerbaijan's economic achievement is highly dependent on oil, which risks turning into a 'resource curse' if revenues are not used to strengthen other economic sectors. Before certain industries – such as chemicals, cement production, and engineering – can be revitalized waste-processing technologies must first be modernized.

The increase in the number of energy transport networks (oil and gas pipelines, terminals and railways) transiting Azerbaijan requires the introduction of specific measures to maintain their safety, with respect to environmental risks and to terrorist attacks.

"Regional and trans-regional groups and entities, such as the Silk Road, TRACECA, and GUUAM … spur economic growth and buil[d] better understanding among the nations, thus both promoting regional political and economic cooperation and contributing to … global security."

Remarks by His Excellency Elmar Mammadyarov, Minister of Foreign Affairs of the Republic of Azerbaijan, Statesmen's Forum of the Center for Strategic and International Studies Washington, DC, July 20, 2004. www.csis.org/energy/040720_mammadyarov.pdf

Preservation of agricultural land and protection of natural species are particularly important as half of Azerbaijan's population remains in rural areas. But with the crisis of recent years and with the agricultural reform underway, various phenomena have emerged that undermine productivity: disruption of crop rotation and land-use systems; changes in the use of summer pasture and overgrazing; deforestation of certain slopes by local people deprived of gas and electricity; irrigation and drainage networks abandoned or poorly maintained; irrational use of water from artesian boreholes, etc. These processes accelerate land degradation, accentuating the formation of badlands, or lead to the rise in groundwater levels causing salinisation of arable land. Mud banks have recently formed, blocking the Kura estuary. Use of Genetically Modified Organisms has started without any supervision, with unforeseeable effects on biodiversity.

The protection of national parks and nature reserves has slackened in the last 10 years. The status of these reserves needs to be improved, as protected areas play a decisive role in protecting biodiversity and offer a useful starting point for the development of ecotourism. A transboundary biosphere reserve based on the Zagatala (Azerbaijan) and Lagodekhi (Georgia) state reserves would be a good start.

Tourism along the Caspian coast is a valuable asset for the future but urgent measures are required to control unauthorised urban development in some areas, such as the Apsheron peninsula, and to build the necessary water supply and sewer mains and sewage-treatment plants.

Last, the urban area of Baku has had to deal with the combined environmental and social consequences of economic growth and the influx of refugees and IDPs. Urban growth is outstripping infrastructure capacity, and includes both the settlement of displaced persons, but also the near-anarchic construction of new buildings and second homes in this urban centre. There is a need to review zoning plans to better manage the mosaic of residential, industrial and agricultural land, at a time when the city is growing rapidly.

Environment and Security Priorities

Nagorno-Karabakh and adjacent regions: These areas, out of the control of the central authorities, represent a major challenge for the environment and security of Azerbaijan. Apart from the demarcation zone which remains particularly sensitive, several major problems affect the area: water management, use of surface and underground water reserves, management of forest resources and protected areas, and population movements. An in-depth field technical assessment by a group of international experts accompanied by local ones, would help to answer some of the questions and complaints that have been raised, including claims relating to cultivation of narcotics, and measure the consequences for adjoining areas in Lower Karabakh.

Central Kazakh and Tavuz districts: The west-central part of the country, from Akstafa to Evlakh and Ganja, hosts a significant share of the environment and security challenges now facing Azerbaijan. At the point where the Kura enters Azerbaijan territory, the problems of water quality and management are particularly acute. Several large industrial centres, throwbacks to the Soviet period, are located there (Ganja, Mingachevir, Dashkesan) and require specific environmental measures. Improved land use, whether or not crops are irrigated, and the availability of summer and winter pasture, are vital to the livelihoods of local communities and to the ecological balance of this fragile, dry habitat. As part of a cross-border study, this sector could be the focus of a specific programme to promote sustainable resource management.

Greater Baku: The capital city and surrounding communities, including part of the Apsheron peninsula, is home to more than a third of the country's population and two-thirds of its industrial production, including almost the entire petroleum extraction sector. It hosts nearly all of the country's environmental ills: rapid and unregulated urban growth; industrial pollution, due to present activity or inherited from the Soviet era; poor water and air quality, taking into

account the spread of automotive traffic with obsolete motors; and management of the Caspian coastline in line with variations in sea level.

The Kura Estuary and Caspian coastline: The lower Kura river basin and adjacent coastal area on the Caspian Sea is home to many of the ecological problems facing Azerbaijan. These include poorly maintained or abandoned irrigation and drainage networks; rising groundwater levels causing salinisation of arable land; and overgrazing of winter pastures. Mud banks have recently formed, blocking the Kura estuary, while Caspian Sea level rise has threatened coastal infrastructure and forced many communities to relocate.

Environment and Security review: Georgia

The westernmost country of the Southern Caucasus, Georgia, borders on the Black Sea. The Greater and Lesser Caucasus mountain ranges cover about 85% of the country but most of the 4.5 million inhabitants live along the coast or in the wide basins formed by the Kura (or Mtkvari) and Rioni rivers.

Soon after gaining independence in 1991, Georgia's trade patterns were disrupted, undermining its economy. The outbreak of armed conflict left some parts of the country beyond the control of the central government.

Natural potential and biodiversity under threat

Georgia's climate is diverse, ranging from year-round subtropical conditions on the Black Sea coast, to continental conditions in the east. Its lowlands have been extensively transformed for agricultural purposes but large areas of native vegetation and wildlife remain in the western and mountainous regions. Dense forests and woodland cover 41% of the country. Natural space is a major asset for the future, not only for the development of agriculture but also of tourism, two fundamental sectors of the economy.

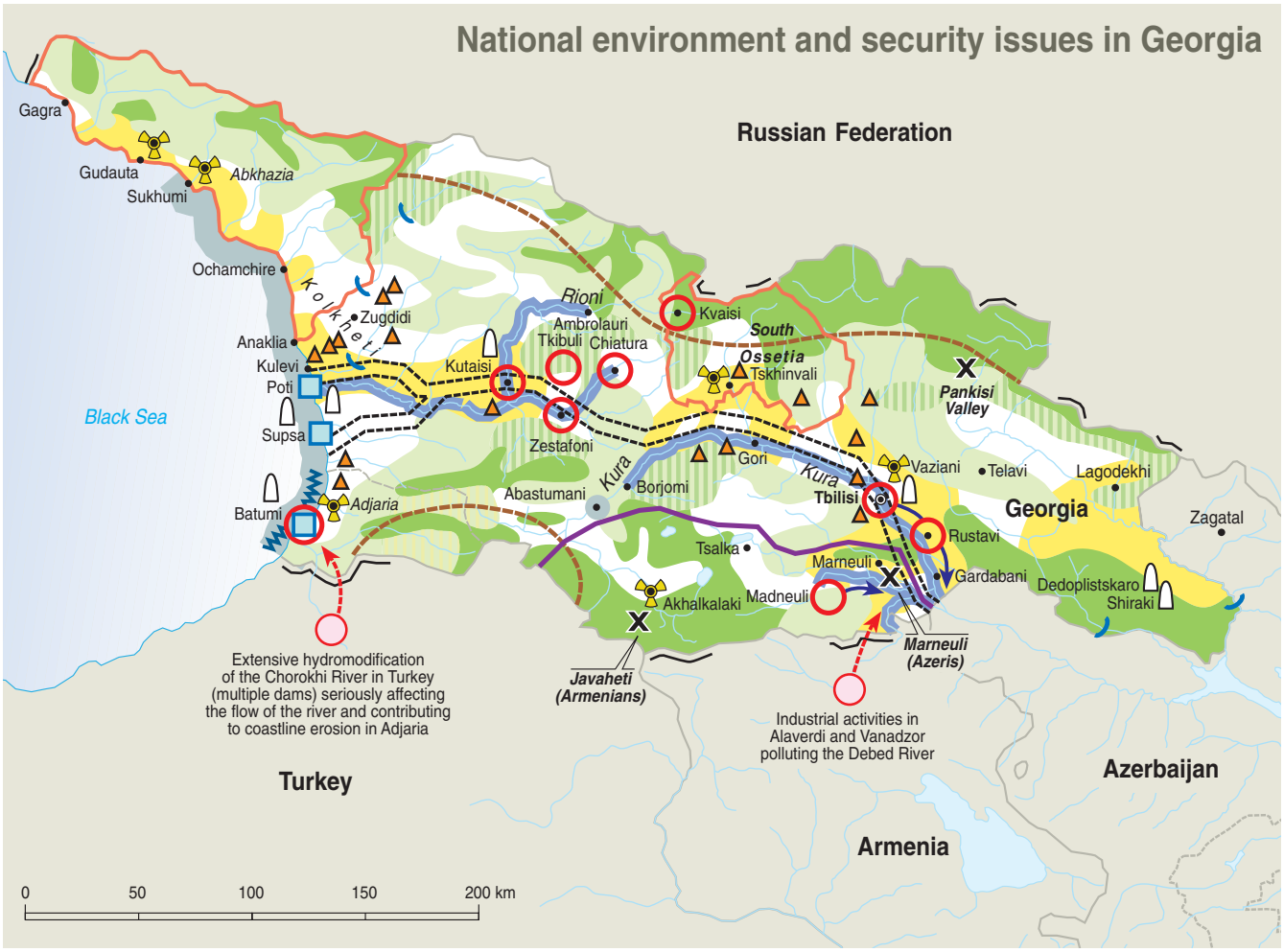
Georgia is vulnerable to several dangerous geological and hydro-meteorological phenomena, a consequence of the complexities of the Georgian landscape, and of the geological and bio-geographical conditions of its territory. The major natural hazards in Georgia include mudslides and avalanches in mountainous areas; hail on annual crops or vineyards; drought in the eastern part of the country; and landslides in the foothills, all of which may cause environmental refugees. Recent studies on the potential impacts of climate change suggest that this will alter the frequency, duration and intensity of extreme hydro-meteorological events, increasing hazard risk in Georgia[17]. The whole of Georgia is a zone of significant seismic activity, with the uplands of southern and northern Georgia being at particular risk (magnitude-9 wave zone, while the rest of the country belongs to the magnitude-8 wave zone).

Recovering from crisis while respecting the environment

The country's diverse ecology is subject to two threats that could alter its balance. Global climate change may exacerbate certain natural hazards. But most immediately, the recent period of crisis may have substantially weakened the state's ability to control the way the country's resources are used.

An energy crisis in the country has resulted in intensive illegal logging, especially in rural and mountainous areas, where the population must exploit forest resources to survive. Incentives for illegal export of valuable timber and endemic tree species from the conflict areas of Georgia and in particular from Abkhazia, are exacerbating deforestation.

17. UNEP/GRID-Tbilisi. Caucasus Environment Outlook, 2002.



Mines and Industrial activities

- Large ageing Soviet industrial complex still generating pollution (mines and poorly disposed tailings; chemical, power generation, and metallurgical plants)
- Foreign water diversion structures or industrial processing plants affecting Georgian rivers
- Pollution of Azeri surface water by sources within Georgia
- Oil terminal (risk of oil spills)

Water issues

- Domestic polluted waters
- Pollution of groundwater by biological and medical waste
- Poorly maintained dam threatening downstream communities

Black Sea coast

- Bacterial pollution and eutrophication from untreated waste water
- Erosion of coastline

Land degradation

- Soil pollution and erosion: high levels of pesticides and /or heavy metals (mainly inherited from the Soviet period)
- Forest
- Area affected by deforestation
- Area at risk of landslides
- Pasture degraded by overgrazing

Security issues

- Areas of conflict and out of control of central authorities
- Areas vulnerable to ethnic or political tension
- Nuclear waste (generally located close to former Soviet or Russian military bases)
- Border crossing at risk of illegal trade
- Munitions dumped, abandoned or unsafely stored
- Refugee camps or settlements

Transportation and communication

- TRACECA (Transport Corridor Europe Caucasus Asia) : Renovated or new multimodal transportion corridor (road, railroad, pipeline)
- BTC (Baku-Tbilisi-Ceyhan): oil pipeline route

Grey dashed lines represent Former Soviet Union administrative boundaries of autonomous regions. South Ossetia and Nagorno-Karabakh have been officialy disbanded.

MAP BY PHILIPPE REKACEWICZ - UNEP/GRID-ARENDAL - JULY 2004

Due to the crisis, the area of land actually being cultivated, and the level of chemicals and other products being produced, have dropped substantially. In many places, however, there are signs of the continued use of harmful chemicals such as dichlorodiphenyltrichloroethane (DDT), Persistent Organic Pollutants (POPs), etc. Uncontrolled exploitation of forests, combined with outdated farming practices and overgrazing, are contributing to land degradation and desertification, threatening agricultural productivity. The import and use of Genetically Modified Organisms without any supervision may also do irreversible damage.

Timber cutting and poaching threaten parks and nature reserves. Uncontrolled hunting is jeopardizing the survival of certain highly prized animal species including bear and deer. Controversial industrial projects have endangered protected areas such as the Kulevi industrial complex in the Kakheti marshlands.

Although the economic crisis has resulted in a reduction in industrial atmospheric emissions, air pollution remains high in the country's major towns. The average annual concentration of hazardous substances in the air significantly exceeds air quality standards. This is particularly the case in Tbilisi where more than a quarter of the country's population is concentrated. Air pollution from growing traffic and obsolete or poorly maintained vehicles, from domestic stoves and generators, and from the absence of effective pollution controls, increase health risks, multiplying respiratory illnesses.

The supply of clean drinking water is an extremely important issue. Georgia's water infrastructure is outdated. A large proportion of pipes are damaged and some 25% to 30% of water is lost through leakage. The municipal sewerage systems in about 45 cities are completely rundown. Treatment facilities are poorly operated and maintained. Few carry out mechanical water treatment, and there is no biological treatment whatsoever.

Integrated management of cross-border water resources, especially in the Kura river basin, would make a major contribution to preventing disputes with neighbouring countries. The government of Georgia intends to ratify relevant international conventions, such as the UN Economic Commission for Europe's Convention on the Protection and Use of Transboundary Watercourses and International Lakes. International effort has focused on the Kura River, now the subject of several international programs. On the other hand, the water supply and coastline of Adjaria in the Georgian Black Sea could be upset by Turkey's planned hydro projects on the Chorokhi River.

The main sources of Black Sea pollution on the Georgian coastline are the ports of Poti and Batumi, as well as the Batumi oil refinery. The Rioni and Chorokhi rivers carry pollutants into the Black Sea, which are then deposited by currents along the length of the Black Sea coast. Recent unregulated construction of tourist amenities (houses, hotels, etc.) poses an additional concern for the environment.

Since independence, Georgia has become an important trade and energy corridor, providing impetus to the national economy, but also creating risks to the environment. In addition to existing pipelines and transport routes, several major pipelines are either under construction (Baku-Tbilisi-Ceyhan) or in the planning phase (Shakh-Deniz-Tbilisi-Erzrum). There is additionally a program underway to rehabilitate or expand key transportation routes (Transport Corridor Europe-Caucasus-Asia, or TRACECA). In addition to preventing leaks and accidental explosions, Georgia must secure this rapidly growing transport network from terrorists, and from natural hazards.

"We are responsible to our people, to its future, to its environmental protection, security and other aspects."

Georgia's Security Challenges. Speaker: Mikheil Saakashvili, President of Georgia, August 5, 2004. http://csis.org/ruseura/040805_georgia.pdf

Managing the Soviet legacy

Economic crisis has led to the almost complete closure of the main Soviet industrial facilities. No measures have been taken however to ensure the long-term safety of the Rustavi and Zestafoni metallurgy and chemicals complexes, or of the Chiatura and Tkibuli mines. In spite of being closed, these mines still pose a significant hazard as a consequence of the unused chemical and heavy metal stocks still on the site. Operational industrial complexes such as the Madneuli copper plant continue to use obsolete technologies and pollute communities downriver. If activity resumes on the closed sites following a change of ownership, measures should be imposed to decontaminate on-site waste and introduce new, non-polluting technologies.

About 300 military facilities fulfilling various purposes – including rocket, tank, and chemical production – were established on Georgian territory during the Soviet period. With the chaotic withdrawal of the Russian military, some of the facilities have been handed over to the Georgian authorities, whereas others have simply been abandoned. These sites have never been properly secured and the population living nearby often uses these "abandoned"

areas for farming and other purposes. In some cases local people have been wounded by exploding mines or exposed to radiation. Furthermore, the socio-economic and environmental impact caused by the closure of military bases must be taken into serious consideration as in the case of the Russian military base at Akhalkalaki, in Javakheti.

Nuclear and radiation safety are issues of particular concern. Since 1995 more than 230 radioactive sources have been discovered in Georgia. Illegal import, export and transit of such nuclear and radioactive materials must be prevented.

Environment and Security Priorities

Black Sea coastal zone, from the Turkish border to the Russian border: In addition to its fragile indigenous ecosystems (dense forests and wetlands), this coastal region also includes some of the country's major industrial sites (ports and oil terminals). It is also a main area for coastal tourism, currently under rapid development. In Abkhazia, little or no information is available on whether and where radioactive materials have been disposed, and on the levels of radiation they generate. Local authorities, the Georgian central government, the local population and the international community, would all benefit from new information on the development and effects of radioactive military waste left behind by the Soviet and Russian forces, and on the state of forest and fisheries, mining and hazardous chemicals in the region. The participation of international experts could provide the opportunity to take stock in a non-partisan manner of the significant environmental issues and to recommend appropriate measures pending a final settlement of the Georgian-Abkhaz conflict.

South Ossetia: Due to the lack of information on the environmental situation in South Ossetia, it would be useful to initiate a field assessment of land use and deforestation in this region.

Marneuli-Gardabani: In addition to its mixed population (Armenians, Azerbaijanis and Georgians), this region is affected by such major environmental concerns as water scarcity and environmental degradation from agricultural and industrial activities. The region could also be part of a transboundary project with the Lori-Tavush region in Armenia and Kazakh-Tavuz in Azerbaijan.

Urban area of Tbilisi: With more than a quarter of the country's population, the capital region is affected by all the country's current major environmental issues: high concentration of migrants and refugees, growing water and air pollution, and uncontrolled urbanisation.

The road ahead

This assessment report is the starting point for the ENVSEC Initiative in the Southern Caucasus for implementation over the initial period of 2004-2006. To address the environment and security issues identified as priorities in this report, UNDP, UNEP and OSCE are working with the governments of Armenia, Azerbaijan and Georgia to define a work programme with the following pillars:

- **In depth vulnerability assessment, early warning and monitoring of areas "at risk"**. ENVSEC partners will carry out more detailed assessments of selected areas and issues identified as environment and security priorities, determine the specific activities needed to remedy the identified threats, initiate projects and catalyse international attention. Specifically:
  - With the approval of the authorities, international technical assessments of environmental degradation in zones of conflict and bordering districts such as Nagorno-Karabakh and adjacent regions of Azerbaijan; South Ossetia and Abkhazia; Lori, Tavush, Marneuli, Gardabani, Kazakh and Tavuz; Sunik and Nakhitichevan.
  - In coordination and cooperation with ongoing programmes and projects, assessment and monitoring of quality and quantity of surface and underground waters in the Kura Araks/Araz river basin, and design of a strategy for the safe disposal of hazardous waste/chemicals located in abandoned and deactivated military sites.
  - In areas identified as priority concerns, development of indicators with a view to establishing long-term early warning of environment and security risks.

- **Policy development and implementation**: ENVSEC partners will work with host governments and international partners to approach environment and security interactions in a coherent manner. This will include:
  - Efforts to promote inclusion of security considerations into the implementation of Multilateral Environmental Agreements, strategic environmental assessments (SEA), national and regional environmental policy programmes; and of sustainable resources management provisions in conflict prevention strategies, and development assistance programming.
  - Assistance to authorities and stakeholders in the implementation of key environmental conventions and legislation of relevance to the promotion of peace and stability.

- **Institutional development, capacity building and advocacy**. ENVSEC partners will strive:
  - To improve local knowledge, assessment, monitoring and reporting capacities.
  - To facilitate programmes that strengthen institutional and individual environmental management capacities with a specific focus on the geographic areas and issues identified as environment and security priorities.
  - To strengthen the analytical and policymaking capacity of national and local experts and decision makers, to deal with environmental issues with security dimensions. Examples include: building the capacity of stakeholders to develop strategic environmental assessments with a security component; working with local and municipal authorities and stakeholders; increasing access to information through support of environment and security journalism, and through dissemination of information materials.
  - Together with local partners, to launch of a a comprehensive awareness, dialogue and consultation campaign to target the public on issues of common concern.

- Infrastructure development, restructuring and remediation activities: Tackling certain environment and security priorities, such as damaged or at-risk water and irrigation infrastructure, hazardous chemicals sites, obsolete industrial sites, etc., will require infrastructure development, restructuring and remediation activities. UNDP, UNEP and OSCE can assist in assessing needs and seeking the assistance of donors and organisations with the financial, technical and field capacity for the implementation of such projects.

As a first step, following up on the national consultations of May 2004 and on conclusions of the environment and security assessment presented in this report, the ENVSEC partners, have worked with local partners to initiate a process for the establishment of National Co-ordination Groups with the objectives of: discussing the ENVSEC work plan and advising on national and transboundary priority needs and on identification of issues and interventions at the national level; facilitating project development, implementation and monitoring; and facilitating inter-agency and inter-ministerial exchange of information on priority environment and security linkages.

UNDP, UNEP and OSCE are pleased that NATO has joined the ENVSEC Initiative as an associate, and invite other organizations, institutions, foundations and donors to join the Initiative as full partner, to sponsor and co-operate in the implementation of activities within the framework of the Initiative, and to lend their expertise to this common effort in support of more peaceful and sustainable development.

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